

DIGEST OF THE KINGDOM OF

# the netherlands

ECONOMY

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# Digest of the Kingdom of the Netherlands

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**ECONOMY**



Colophon:

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## The Foundations of the Economic Structure of the Netherlands

### Introduction

The total area of the Netherlands is about 40,900 square kilometres (15,000 square miles); a very large proportion of this consists of water (estuaries, lakes and rivers); the land area is only about 33,500 square kilometres (12,750 square miles). Compare this with France, the area of which is 551,000 and with the United States which covers 7,828,000 square kilometres.

The Dutch climate is mild, far milder in fact than the high northern latitude of the country (51°-54° N) would lead one to expect. This is due to its situation, with a long and frequently broken coastline, on the North Sea, which, as an inland sea leading into the Atlantic Ocean, also benefits from the presence of the warm Gulf Stream. The Netherlands has mild winters and cool summers, the summer temperature varying between 20 and 25 degrees C.

Geologically, much of the country is of very recent origin and has largely been formed from material washed down by the rivers Rhine, Maas and Scheldt. Many of the most fertile and economically important areas have only arisen in very recent centuries – in some cases even in the most recent decades – as a result of endiking and draining.

At present, the Dutch are still working on the world's largest land reclamation project, the draining of the Zuyder Zee, where some 122,000 hectares (300,000 acres) of fertile land have already been gained. When the work is completed the total gain will be about 221,000 hectares (544,000 acres), increasing the cultivable area of the Netherlands by 9%.

As a result of the particular way in which the land has been formed, reclaimed and retained throughout the centuries, more than half of the inhabited area of the Netherlands – and the most densely populated part, at that – lies below sea-level, protected by well constructed dikes. The manner in which the Dutch have had to reclaim their home from the sea has made them the world's specialists in the building of dikes and embankments, the construction of canals and harbours and the drainage of estuaries and lakes. For centuries and right up to the present day the help of Dutch specialist designers, contractors, supervisors and workmen has been enlisted all over the world for tasks of this nature.

There are now 12,000,000 people living in this country. The Netherlands, with a population density of 358 inhabitants per square kilometre (912 per square mile) of land, is the most densely populated country in the world. Moreover, the population is still increasing very rapidly – by 150,000 persons a year – as a result of a birth rate which is high by Western European standards, but particularly owing to a continually falling death rate resulting from constantly improving hygienic conditions and medical care. Every new-born Dutch baby now has an average chance of living to the age of 73.1.

The high density of population, the difficulties that have had to be faced in order to make large tracts of infertile ground productive and the very scanty supply of mineral deposits have all made it necessary for the people of the Netherlands to make the most intensive use possible of their limited natural resources.

The low-lying clay and peat soil regions, wrested from the sea, lend themselves readily to agriculture. Thanks partly to the favourable humid climate, they are especially suitable for stock-



breeding and horticulture. Agricultural products serve partly to supply the immediate requirements of the Dutch themselves (breadgrain, potatoes, sugar, meat, eggs, milk, vegetables and fruit), but are also to a very large extent available for export and are used as raw materials for a highly developed food industry.

A very large part of the produce of this industry (such as butter, cheese, condensed milk, potato flour, bacon, meat, tinned fruit and vegetables, jams) is exported. It is a remarkable fact that this densely populated country with its limited amount of fertile ground is the world's largest exporter of eggs, potatoes, potato flour, condensed milk and cheese.

It has only been possible to achieve this position in the world market by means of very highly developed techniques of cultivation and stock-breeding. Holland has the greatest yield per hectare of potatoes and sugarbeet; its cows give the highest milk yield in the world. These results can only be achieved by extensive use of fertilisers and cattle fodder. Greater use is made of artificial fertilisers in the Netherlands than anywhere else in Europe. In this way a large part of the land which has little natural fertility can also be developed to serve the ends of production. The extensive use of fertilisers and cattle fodder calls for the importation of large quantities of these items. So to some extent Dutch agricultural exports may be regarded as the products of the 'up-grading' of imported raw materials.

In this way the greatest possible degree of profit is derived from agriculture, market-gardening and cattle-breeding, for all of which pursuits the soil and the climate of the Netherlands are in many respects very suitable.

Industry, on the other hand, has barely enough natural resources to warrant its existence; there are hardly any raw materials in this country. Only a few more or less restricted coal deposits, a little petroleum and larger quantities of natural gas are found. Nevertheless, with the use of the few minerals that exist large chemical industries have been built up. Industries have also been established for the further manufacture and processing of produce from the agricultural, market-gardening and stock-breeding industries. But apart from these activities Dutch industry is wholly dependent upon imports of the primary raw materials. The country's favourable geographical position, both in regard to countries overseas and to the European hinterland, compensates for its lack of raw materials. The advantages afforded by this position have made it possible for an extensive industrial machine to be built up in the Netherlands without the aid of protectionist measures, a machine that includes diverse staple industries such as steel works, oil refineries, tinplate works and zinc-smelting plants.

To offset the imports of iron, tin and zinc ores, crude oil, crude phosphate, wood, raw cotton, etc., there are a large number of exports of such commodities as iron, tin, cigarettes, cotton fabrics and electrotechnical products.

In this way the Netherlands, which in former times lived mainly from agriculture, trade and shipping, was able to develop into an important industrial country. This development was strongly encouraged after the Second World War by the Netherlands government in view of the pressure exerted by the population increase. 42 % of the working population of the Netherlands is now employed in industry, as against 10 % in agriculture.

The tremendous significance of Dutch imports and exports as a result of the industrial activity outlined above is shown by the fact that during 1961, with a national income of fls. 40,350 million<sup>1)</sup> (at market prices), imports amounted to fls. 18,460 million and exports to fls. 16,000 million.

<sup>1)</sup> 1 Dutch guilder = two shillings = 28 U.S. cents.

If another basis of comparison is desired, it could be said that in 1961 Holland's imports per head of population reached a value of fls. 1,590 and its exports fls. 1,375.

The Netherlands relies more than any other country of the Continent of Europe on the widest and freest possible commercial intercourse with the entire world. Its biggest customers for goods and services are naturally its nearest neighbours: the German Federal Republic and Belgium. It also has important commercial relations with the United States, the United Kingdom, France, Sweden and Italy. But the Netherlands maintains close economic relations with every country in the world and continued efforts are made to intensify these relations. As we have already seen, it is on this that the livelihood of its inhabitants depends.

As a rule the Dutch trade balance shows an excess over exports (in 1961 the difference in value was 3,000 mln. guilders). The percentage of imports covered by exports varies from 80 to 90 per cent. This deficit is, however, amply compensated by what is called the 'services balance' surplus, which is derived from the wide range of services that are carried out by the Netherlands on behalf of other countries, especially in the fields of international sea and river transport, air freight and road haulage, clearing-house and money market facilities and insurance. In the 'good old days' the Netherlands also invested a great deal of capital abroad and the income from this, in addition to the proceeds from the services it supplied, enabled the country constantly to import considerably more than it exported. The war and its consequences have had a very serious effect on these capital assets abroad and the income derived from them. Nevertheless even now returns on capital still provide a substantial net surplus on the Netherlands balance of payments. But the trade and transport services supplied to other countries contribute to a far greater extent than returns on capital towards covering the deficit on the trade balance, and thereby towards closing the balance of payments.

As inhabitants of the common delta of the rivers Rhine, Maas and Scheldt, which is traversed by numerous watercourses, the Dutch became familiar with water transport at a very early period.

The Dutch merchant fleet with 1,500 vessels totalling 4,800,000 tons, ranks seventh on the list of world mercantile tonnage. Rotterdam is the largest port in Europe. The Dutch airline, K.L.M., is one of the most important in the world; operating from Amsterdam it maintains regular services to Johannesburg, Santiago de Chile, Tokyo, Sydney, etc. Dutch merchants carry out many more international transactions than is apparent from the movement of goods across the frontiers of Holland.

All this has been evolved and determined by history. We have seen that, except for its geographical position, Holland has not had nature on its side. The nation has flourished in the face of adversity. We will not dispute the question as to whether the character determined the environment or the environment the character. Be that as it may, one will never understand Holland's economic achievements and its rôle in the world's economy if one ignores the Dutch mentality. Geographical factors, such as a favourable situation or a particular climate, cannot in themselves provide an adequate explanation of the high level of agricultural development, the great expansion of industry, the skill in carrying out all operations connected with dikes, canals, bridges, etc., and the great part played in commerce and shipping, all of which activities are economically characteristic of the Netherlands.

All these things must be explained in terms of the special character of this nation, which can perhaps best be described as practical and down-to-earth.



## The Financial and Economic Development of the Netherlands 1956–1961

In the last 10 years the Netherlands has experienced remarkable economic growth. Apart from brief setbacks in the less prosperous years 1952 and 1958, employment has remained at a high level. In that period the rate of expansion of production was higher.

Trade with other countries, encouraged by the abolition of a number of restrictions, increased to a marked extent in volume and importance. The considerable increase in the demand for labour and the accompanying rise in purchasing power expanded domestic markets, so that investments – already favoured by greater sales abroad – were further stimulated.

The period 1946–1952 presents a picture of the recovery and reconstruction of the Dutch economy. This made large-scale investments necessary, for which insufficient domestic savings were available. In the period 1952–1955 savings greatly exceeded investments. In 1956 this picture was disturbed by a sudden increase in domestic spending, producing deficits in the balance of payments and a loss of foreign exchange. In order to restore the balance the Dutch Government announced a programme at about the end of the fiscal year 1956–1957 imposing restrictions on Government and private spending in both the consumer and the investment spheres. This programme included restrictions on Government expenditure, fiscal measures, an increase in rates for public utilities and a reduction of municipal capital expenditure to the limits imposed by sound financing.

Overspending was brought to an end in 1957, partly as a result of the financial policy of the Government. The turn of the tide in the national economy was to be seen in an improvement in the balance of payments, an easing of the money and capital markets, a relaxation of tension on the labour market and price drops for some investment goods. A renewed expansion set in as from the middle of 1958.

For the development of the national economy 1959 and 1960 were exceptionally prosperous years, in which production rose to unprecedented levels. The main factors in this development were a big foreign demand for Dutch products and the resulting strong increase in investments. Exports reached record levels. The rapid expansion of the economy was accompanied by a gradual exhaustion of the labour reserve and, at the end of 1959, the point was reached where the demand for labour exceeded supply. In 1960 this development continued, with the result that increasing tension was to be observed in the labour market. One of the results was that the tendency to attract employees by improving labour conditions (introduction of the 5-day working week) greatly increased. This threatened the stability of price levels, one of the primary aims which the Government managed to achieve for the greater part of 1959 and 1960. On the other hand, the balance of payments on current account continued to display big surpluses in 1959 and 1960. It was in this situation that the Netherlands Government found itself when suddenly confronted on March 4, 1961, by the revaluation of the German Mark. As it was considered that this measure, because of the great importance of Germany as Holland's trade partner,

would have the effect of aggravating the existing imbalance, the Dutch Government decided to follow suit. After approval had been obtained from the International Monetary Fund, the parity of the guilder in relation to gold was raised by about 5% on March 7, 1961.

This development is reflected in statistics, as is apparent when one compares the development of national income with national expenditure. The picture we derive of the development of the balance of payments on current account can of course also be obtained by comparing imports and exports of goods and services.

TABLE I

	National income at market prices	Total national expenditure	Exports of goods and services	Imports of goods and services	Balance on current account of balance of payments
	<i>(in millions of guilders)</i>				
1955	27,540	26,760	15,123	14,342	781
1956	29,560	30,310	16,278	17,028	— 750
1957	32,000	32,590	18,029	18,623	— 594
1958	32,390	30,860	18,177	16,644	1,533
1959	34,690	32,900	20,136	18,353	1,783
1960	38,540	37,340	22,710	21,510	1,200
1961	40,190	39,670	23,180	22,660	520

It is clear from this table that, particularly in 1956, national expenditure was higher than national income. The balance on the current account of the balance of payments dropped between 1955 and 1956 by more than f1,500 million because national expenditure rose much faster than national production. The year 1957, too, produced a deficit. Exports in those years were far below the large rise in imports. In 1958 the national income again displayed a further rise, despite the fact that it was a depression year, partly because exports showed a slight rise. Since, on the other hand, national expenditure and imports dropped fairly sharply, the balance of payments improved to the extent of more than f2.1 thousand million. In 1959 and 1960 exports and national income again displayed a sharp rise, which was accompanied by generous surpluses on the current account of the balance of payments.

### Expenditure

Further details of the total national expenditure, as represented in Table I, are included in the survey on the next page. In this survey, items of expenditure are expressed in percentages of national income.

Between 1955 and 1960, private consumption was highest in 1956, the year of overspending. In succeeding years consumer expenditure in the private sector gradually fell behind the development of national income. Government expenditure showed the same tendency. Investments – including the formation of stocks – reached what was, relatively speaking, a peak in 1956 and 1957, dropped in 1958 and again expanded rapidly in 1959, 1960 and 1961.



TABLE II  
Domestic expenditure (in percentages of gross national income) at market prices

	1955	1956	1957	1958	1959	1960	1961
<i>Private Sector</i>							
a. Consumer expenditure	58.4	60.0	58.4	58.5	57.9	56.9	56.9
b. Gross investments in fixed assets	12.0	13.5	12.8	11.0	11.8	12.4	12.4
c. Stocks	2.1	2.2	2.6	0.3	0.7	3.3	3.3
<i>Housing</i>	3.7	4.6	5.2	4.9	4.7	4.3	4.3
<i>Government</i>							
a. Consumer expenditure	14.3	15.1	14.9	14.5	13.6	13.5	13.5
b. Gross investments in fixed assets (including government spending)	6.7	6.7	7.7	6.5	6.7	6.8	6.8
Balance on the current account of the balance of payments	2.8	-2.1	-1.6	4.3	4.6	2.8	2.8
	100	100	100	100	100	100	100

Although consumer expenditure in the private sector did not keep pace with the rise in national income, and even declined relatively, the consumer quantity per head of the population between 1955-1961 finally displayed a rise of more than 16%. This expansion took place particularly in the years 1956 and 1960.

TABLE III  
Private consumption (total, per capita, 1953 = 100)

1955	1956	1957	1958	1959	1960	1961
112	121	119	117	119	126	130

In 1958 the regulations governing hire purchase were eased in view of the relaxation of economic tension and the disappointing sales of durable consumer goods. Subsequently, in September 1960, the economic situation caused the Government to make the conditions for hire purchase more strict.<sup>1)</sup>

#### Cost of Living and Wages

In 1961 the average price index for the cost of living was nearly 21% higher than the 1955 level. To a large extent this rise was a consciously accepted result of the old age pension insurance

<sup>1)</sup> In August 1961 further measures to put a brake on hire purchase credits were introduced.

scheme introduced in 1957, the rent increases announced in 1957 and 1960 and the increase in a number of charges for government services. These decisions, accompanied by simultaneous wage compensations, also influenced the wage level. Between 1955 and 1961 wages rose by about 41%, part of this being accounted for by the compensation just mentioned. An important factor in the development of prices and wages was the policy of the Dutch Government on this point, which was the result of consultations with the organizations of Dutch industry (see the chapter on economic policy).

TABLE IV  
Prices and wages (1955 = 100)

	1955	1956	1957	1958	1959	1960	1961
Cost of living	100	102	112	115	116	119	121
Gross collectively agreed wages (total)	100	105	117	121	124	136	141

#### Investments and Savings

In Holland investments are relatively high. In 1955-1961 net investments in fixed assets totalled on average about 16% of net national income. Investments in fixed assets and in stocks combined amounted on average to 18% (average gross investments in fixed assets amounted in this period to nearly 24% of the gross national product, as is apparent from Table II). From one year to the next, however, these averages have been subject to fairly considerable fluctuations. Thus in 1957 investments rose sharply, while they dropped equally sharply in 1958. In 1959 and 1960 they again reached a relatively high level. In order either to stimulate or discourage investments the Government either applied or restrained the fiscal stimuli in the form of advanced depreciations and deductions on investments. At the end of 1955, for example, the opportunity for accelerated depreciations was limited while a year later the deductions on investments were temporarily suspended. In 1958, when the balance between means and expenditure had recovered from the upset in 1956 and 1957, and when investments were clearly lower, deductions on investments were again allowed and at the beginning of 1959 there was an easing of restrictions on accelerated depreciations. In the spring of 1960 the Government again introduced restrictions on investment facilities. The vigorous expansion of investments in 1959 and 1961 was stimulated not only by optimism regarding sales but also by increased investments in depth, directed towards an increase in productivity, all in consequence of the increasing shortage of labour.

A high level of investments entails a great need for saving. In 1956 and 1957 savings were lower than total investments, which was reflected in deficits on the current account of the balance of payments. At the end of the period 1955-1960, however, savings reached nearly 24% of the national income - a considerably higher level than in the period 1955-1958, when national savings amounted on average to about 19%.

TABLE V  
Investments and savings 1955-1961

	Net investments in fixed assets	Stocks	Total net investments	Savings	Balance on current account of balance of payments
	<i>(in millions of guilders)</i>				
1955	4,070	650	4,720	5,500	780
1956	5,140	720	5,860	5,110	— 750
1957	5,760	910	6,670	6,080	— 590
1958	4,540	90	4,630	6,160	1,530
1959	5,210	270	5,480	7,260	1,780
1960	6,040	1,400	7,440	8,640	1,200
1961	6,610	1,300	7,910	8,430	520

#### Capital and other Countries

We have already made frequent reference to the trend of the current account. In the period 1955-1960 the capital account displayed marked fluctuations, as is apparent from Table VI. For example, in 1955 and 1956 an average of more than f 500 million in capital was exported (short-term and long-term capital together). In the two succeeding years there was a net capital import averaging f 450 million. In 1959 and 1960 there was again an average export of capital totalling about f 450 million.

TABLE VI  
Capital movements in respect of other countries

	1955	1956	1957	1958	1959	1960
	<i>(in millions of guilders)</i>					
Private sector	— 530	— 185	700	900	— 320	110
Government	— 310	— 20	— 140	— 560	— 450	— 250
Total	— 840	— 205	560	340	— 770	— 140

Stock transactions with other countries showed a striking improvement. From 1955 to 1957 purchases of Dutch stock by other countries averaged about f 350 million. However, after 1958 there was a big expansion of these purchases and annual imports of capital averaged f 1,200 million. On the other hand, there was also an increase in the purchases of stock by

#### THE UNIVERSITY OF TEXAS

Dutch nationals. Between 1955 and 1957 an average of f 100 million in capital was exported on this account. In 1959 and 1960 this figure had risen to an average of about f 350 million. It should be mentioned that in 1961 as in 1954 and 1955 foreign guilder bond issues were allowed on the Dutch capital market, but on a limited scale.

#### Gold and Foreign Currency Reserves

The development of the current account and of the capital account of the balance of payments in the past six years has resulted — together with a number of balancing items — in changes in the gold and foreign currency reserves. The survey which follows indicates the development of the gold and foreign currency reserves of the Netherlands Bank and the foreign exchange banks between 1955-1960.

TABLE VII  
Gold and foreign currency reserves

	Netherlands Bank	Neth. Bank and Foreign Exchange Banks
	<i>(in millions of guilders)</i>	
End 1955	4,690	4,520
End 1956	3,910	3,560
End 1957	3,970	3,970
End 1958	5,570	5,620
End 1959	5,070	5,970
End 1960	6,580	7,080
End 1961	6,090	5,930

According to this table there was a shift, as from 1958, in the foreign currency reserves from the Netherlands Bank to the foreign exchange banks. These latter banks, to a growing extent, deposited abroad the surpluses produced by the balance of payments, since a higher return could be obtained there than in the Netherlands. The Netherlands Bank assisted in this by its policy with regard to the domestic level of the money market commission.

#### Liquid Assets

In Table VIII a survey is given of the composition and development of the domestic liquid assets in the period 1955-1960. The secondary liquid assets mentioned in the table comprise all claims on the Government and money-creating institutions (which are in the hands of holders other than money-creating institutions) which can be converted into cash at short notice, en masse, and without big losses.



TABLE VIII  
Domestic liquid assets

	1955	1956	1957	1958	1959	1960	1961
	(in millions of guilders)						
Primary liquid assets							
a. money in circulation	4,100	4,210	4,350	4,580	4,680	5,090	5,400
b. money on clearing accounts	5,490	5,020	4,710	5,560	5,920	6,230	6,700
Secondary liquid assets							
a. claims on the State	1,310	970	1,010	1,320	1,420	1,390	1,400
b. claims on local Government	360	580	1,060	1,300	900	540	400
c. claims on money-creating institutions	1,900	1,950	2,310	2,790	3,550	4,370	4,500
Domestic liquid assets	13,160	12,730	13,440	15,550	16,470	17,620	18,500
Idem in % of national income	45.8	41.6	41.2	46.4	44.6	45.7	

The relative significance of the liquid assets emerges from the last line of the table, which gives the 'liquidity' ratio. The sharp drop of the liquidity ratio in 1956 and 1957 was connected with the deficits on the balance of payments, which resulted in liquid assets going abroad. Whereas in 1958 the large surplus on the balance of payments resulted in a marked rise in the liquidity ratio, the surpluses on the balance of payments for 1959 to 1961 were accompanied by a decline, viz. a regular rise in the relationship between liquid assets and national income. This was attributable to a rise in national income and to the freezing of liquid assets by means of the consolidation of debt on the part of the Government, as a result of which a total of f2.8 thousand million in liquid assets was withdrawn from circulation from 1959 until 1961.

#### Capital Market

In 1956 and 1957 the capital market experienced a serious shrinkage because, on the one hand, investments greatly increased and, on the other, offers of capital (especially by institutional investors) declined. Local government bodies found themselves in serious financing difficulties and the net floating debt of the municipalities rose between the end of 1955 and the end of 1957 from f258 million to f2,131 million. In 1958 there was a rapid recovery in the relationship between supply and demand on the capital market, partly owing to an influx of liquid assets from abroad. Since then, interest has dropped gradually. Not only did local governments resume the financing of capital expenditure on a normal basis, but they also managed to consolidate the greater part of the floating debt of the municipalities, which had risen so sharply in preceding years. All this was possible despite the vigorous expansions in 1959 and 1960 and despite the fact that in those two years the Government had frozen liquid assets to the sum of f2.2 thousand million. Consequently in April 1961 the issue of permits for foreign guilder bond issues on the Dutch capital market was resumed on a restricted scale.



Thrift is encouraged by the many savings banks in Holland.



### The Monetary Policy of the Netherlands Bank

By using the instruments of discount policy, open market policy and cash reserve policy the Netherlands Bank conducted in the period between 1956 and 1960 a flexible policy adapted to changing circumstances.

In the period of overspending, the Bank contributed towards stability by raising its discount rate and by restricting credit. Subsequently, the Bank co-operated in creating the conditions for a balanced growth of the economy. In 1959 and 1960 the policy of the Bank was, moreover, directed towards preventing too great a shortage on the money market in order to counteract an influx of foreign investments from the foreign exchange banks, which was also undesirable from the point of view of international stability.

### Development of Government Finances

This survey of the financial and economic development of the Dutch economy should also include an outline of the development of Government financing in the period from 1956-1961. Admittedly, the absolute level of Government expenditure rose considerably in this period, as is apparent from Table IX. But when Government expenditure is related to the development of national income, it appears that the development was more gradual. In this connection it should be noted that expenditure from 1958 onwards was strongly influenced by the fact that the costs of the construction of subsidised houses, which had previously been the responsibility of the municipalities, were charged to the national budget. If account is taken of this, one sees that Government expenditure tends to decline.

TABLE IX

Year	Expenditure	Total in % of nat. income	Expenditure Govt. means	Budget Balance
	(in millions of guilders)			
1956	7,782	25.7		
1957	7,883	24.0	7,326	— 456
1958	8,052	25.0	8,064	181
1959	9,040	26.1	7,376	— 676
1960	9,420	24.4	8,142	— 898
1961 <sup>1)</sup>	11,260	28.0	9,400	— 20
			9,930	— 1,330

<sup>1)</sup> Anticipated

In recent years increasing importance has been attached to expenditure for structural provisions in the civilian sphere which are closely connected with the growth of the population and the development of the infrastructure (education, housing, transport and waterways, etc.). In order to create the necessary opening for this real expenditure, the Government has attempted to reduce certain categories of expenditure such as subsidies.



The Amsterdam Stock exchange



	1956	1957	1958	1959	Probable final figures	1960	Probable resultant figures	1961	1962	Budget	Budget
General Public Administration	438.5	460.8	424.1	435.9	533.1	792.9	558.0	571.9			
Defence	1,831.5	1,794.5	1,633.8	1,528.1	1,716.7	2,006.0	2,130.7	2,224.4			
Foreign Relations:											
<i>a.</i> International Financial Transactions	34.7	95.0	69.8	567.7	112.6	219.8	188.3	19.3			
<i>b.</i> Other	71.8	86.2	104.3	124.9	142.4	170.8	226.4	193.2			
Surinam and the Netherlands Antilles	32.1	31.5	22.6	25.2	39.6	36.1	41.7	37.8			
Justice and Police (inclusive of Civil Defence)	298.4	347.0	360.7	347.3	391.9	486.2	556.2	585.0			
Transport and Public Works	628.0	667.5	589.1	640.9	729.7	956.7	998.7	1,063.5			
Industry and Trade	218.2	102.3	98.7	157.1	132.7	160.2	165.1	177.5			
Agriculture and Fisheries	434.9	664.2	821.3	670.5	675.5	665.2	630.6	519.9			
Education and Culture	934.0	1,118.4	1,205.9	1,364.7	1,884.0	2,276.4	2,514.0	2,694.5			
Social Service	1,052.5	801.2	964.4	884.2	796.4	1,100.0	1,099.6	1,128.0			
National Health Service	51.8	59.9	71.7	73.8	76.4	83.9	99.1	108.0			
Housing:											
<i>a.</i> Rent Subsidies	244.2	268.6	324.3	368.3	402.1	301.7	263.5	226.5			
<i>b.</i> Cash Advances under the Housing Act	1.3	2.1	192.3	523.6	579.5	547.0	630.0	780.0			
<i>c.</i> Other Housing Expenditure	25.2	16.7	15.6	19.7	21.0	21.1	24.2	30.0			
War Damage and Damage Caused by Natural Disasters	430.8	248.6	190.7	118.3	125.4	107.2	109.9	85.1			
National Debt	838.6	884.2	830.9	1,047.7	980.3	1,243.7	1,104.1	1,103.6			
Payments to Provinces and Municipalities											
for Deprivation of Income Owing to Reduced											
Personal Property and Rental											
Tax and Real Estate Tax	69.4	65.3	67.9	71.5	5.4	6.0	6.2	6.5			
Sundries	0.4	—	0.1	0.5	0.3	0.5	22.4	65.5			
Total, excl. Depreciations	7,636.3	7,714.0	7,988.7	8,969.7	9,345.0	11,181.4	11,377.7	11,990.0			
Depreciations	146.0	169.0	63.0	70.0	75.0	78.0	78.0	82.0			
Grand Total	7,782.3	7,883.0	8,051.2	9,039.7	9,420.0	11,259.4	11,455.7	11,672.0			

Government expenditure (arranged according to subjects) (in millions of guilders)

It is also the policy of the Government to keep the rise in Government expenditure as a whole at a lower level than the structural growth of national income, in order, in the long run, to bring about a relative reduction of Government expenditure and taxation. For a more detailed breakdown of Government expenditure the reader is referred to Table X.

As is apparent from Table IX, Government resources, except in 1957, were inadequate to finance state expenditure. The surplus in the fiscal year 1957 was partly due to the financial policy conducted by the Government, aimed at helping to restore balance to the national economy upset in 1956 by excessive spending. In order to finance budget deficits over the remaining years, the Government made a call on the capital market by taking out long-term loans.

The policy of the Government, in 1959 and 1960, as already mentioned, was to reduce the risk of economic overstrain by attracting more capital than was necessary to finance budget expenditure.

The total national debt dropped to some extent over the period from the end of 1955 to the end of 1960. In that period the foreign debt declined from f2,000 million to f1,500 million. At the end of 1960 the domestic debt was almost as high as at the end of 1955 (respectively, f17.5 thousand million and f17.6 thousand million). However, the proportion of this taken up by consolidated debt had risen from 62% to 71%. In 1961 the foreign debt underwent a further considerable decline partly owing to accelerated redemptions.

In the period 1956-1960 the financial development of the Dutch economy was favourable in a number of respects after an initial brief interruption. In 1960 the Dutch economy was characterized by full employment and steady prices. Production was at a high level and there was a surplus on the balance of payments.

## Summary of Taxes, Duties and Excises

### The taxation system

The most important forms of taxation in the Netherlands are:

#### Direct taxation:

Company tax

Income tax

#### Indirect taxation:

Sales or turnover tax

Import duty

Excise duty

### The following taxes apply to companies:

Company tax (vennootschapsbelasting),  
Dividend tax (dividendbelasting),  
Directors' tax (commissarissenbelasting),  
Real estate tax (grondbelasting),  
Sales or turnover tax (omzetbelasting),

Import duties (invoerrecht),  
Excise duties (accijnzen),  
Stamp duties (zegelrechten),  
Registration duties (registratierichten),  
Motor vehicle tax (motorrijtuigenbelasting).

*The following taxes apply to individuals:*

Income tax (inkomstenbelasting),  
Capital tax (vermogensbelasting),  
Personal property and rental tax  
(personele belasting),  
Dividend tax (dividendbelasting),  
Directors' tax (commissarissenbelasting),  
Real estate tax (grondbelasting),  
Sales or turnover tax (omzetbelasting).

Import duties (invoerrechten),  
Excise duties (accijnzen),  
Stamp duties (zegelrechten),  
Registration duties (registratierechten),  
Motor vehicle tax (motorrijtuigenbelasting),  
Estate, transfer and donation duty  
(successierecht).

A summary of the taxes that affect companies and individuals is given below. Levies in connection with social insurance, and those made by lower public bodies (provinces, municipalities, etc.), are not included. The provinces and the municipalities themselves are authorized to impose taxes – other than income taxes – within narrow limits; furthermore, they receive subsidies from the Treasury.

**Tax Applied Exclusively to Companies**

*Company income tax (vennootschapsbelasting)*

Company income tax is levied on the net profit of:

1. resident companies; (Whether a company is resident in the Netherlands depends on circumstances. A company incorporated under Netherlands law – a domestic company – is always a resident company.)
2. non-resident or foreign companies operating in the Netherlands by means of a permanent establishment covering profits made within the Netherlands.

If a resident company has had a continuous and substantial interest since the beginning of the tax year in a company whose capital is wholly or partly divided into shares, any dividend received by virtue of such interest shall be tax-free insofar as these dividends are not deducted from the book value of the share-holding. With regard to participation in a non-resident company the exemption is only applicable if such company is subject to a similar tax levied outside the Netherlands.

*Tax rates*

From 1 January, 1963, the rates in force are as follows: For taxable amounts up to fls 40,000 the tax levied is 42%; from fls 40,000 up to fls 50,000 the levy is 42% of the taxable amount plus 15% of the amount above fls 40,000. If the taxable amount exceeds fls 50,000, the tax levied is 45%.

*Depreciation*

In determining the taxable profit the theory of the historical cost price or original purchase price has been adopted as far as capital equipment is concerned, so that fiscal write-off may not be

based on the replacement value. Nor may it be adjusted according to the net profit results. For capital equipment a permanent method of depreciation must be adopted, such as writing off a fixed percentage of the purchase value or the book value, or writing off according to the number of hours a machine has worked. The method of depreciation must not be changed until there is a special reason for changing it. The write-off may be based on the economic life instead of on the technical life of the asset. In practice the method of writing off a fixed percentage of the purchase value has been widely adopted, the annual depreciation of machinery often being 10%. If as a result of any abnormal event – for example, fire – the value of equipment decreases suddenly, an extra amount may be written off.

*Accelerated depreciation*

One third of the purchase price of equipment (machinery, buildings, patents, etc.) may be written off at an accelerated rate. However, from 30 April, 1960, not more than 6% per year of this third can be deducted for buildings and not more than 8 1/3% per year for other fixed assets. No extra depreciation is allowed for motor vehicles and office equipment.

*Investment deduction*

Since 1 April 1952 an additional facility has been granted for the procurement or production of fixed assets. Under this, part of the costs of procurement or production can be charged against the profit. The percentage of this investment deduction has varied in the course of the years according to the economic situation in the Netherlands. Since 29 April 1960, it has been possible to charge 5% of the procurement or production costs against the profit for two years. However, for international shipping and aviation the deduction is 2 × 8%. If the fixed assets acquired are disposed of within 10 years, the deduction is revoked by a corresponding addition.

*Inventory valuation*

Inventories may be valued at the actual cost of the goods, but if the market value on the date of balance sheet is lower, this lower value may be taken. For the valuation of inventories what is known as the 'lifo' method may also be applied unconditionally in the case of newly established enterprises and on certain conditions in the case of existing ones. The lifo system means that, with regard to an inventory of a permanent quantitative amount, the same valuation on the balance sheet is applied at the end of the book year as at the beginning of it, so that a rise in the price of these goods is not taken into consideration. If later the market price falls below the original purchase price, the lower price may be adopted while this situation lasts. Recently the High Court approved a system under which a reserve is formed for replenishing the actual inventories, on the date of balancing, up to their normal level. Once a method of inventory valuation has been chosen, one is generally tied to it for the future.

*Special reserves*

Generally speaking, in addition to depreciation reserves the following two kinds of reserves may be deducted from the actual profit in determining the taxable profit:



1. the equalisation or maintenance reserve, which an industrialist may use to distribute evenly the cost of maintenance of assets over the life of these assets by charging a constant amount every year against the profit and crediting a maintenance reserve. The actual cost of maintenance is then debited to the reserve, as in the case of a ship that has to go into dry-dock every two or three years;
2. the self-insurance reserve, which the industrialist may create to cover such risk as would normally be insured.

#### *Carry-forward provisions*

The net profit of a year may be reduced by the amount of losses incurred during the six preceding years insofar as these have not been taken into account. Moreover, new enterprises will be allowed to offset losses sustained during the first six years for an unlimited time against later profits.

#### *Carry-back provisions*

The net profit of a year is also reduced by the amount of losses of the following year.

### **Taxes Levied Exclusively from Individuals**

#### *Individual income tax (Inkomstenbelasting)*

Individual income tax is levied on income (less deductions) of:

1. residents of the Netherlands;
2. non-residents of the Netherlands who have sources of income in the Netherlands.

Residents are liable for tax on their entire net income, and consequently also on income from sources abroad. Non-residents are liable for tax on only their total net income from sources within the Netherlands.

Residents are those who have their place of residence within the Netherlands. Whether the place of residence is within the Netherlands or not is – broadly speaking – decided according to circumstances. If an individual sojourns in the Netherlands, his intentions with regard to the length and the nature of his stay are of importance in settling the question of his place of residence. His place of residence abroad does not necessarily preclude the possibility of a place of residence in the Netherlands.

In the application of the scale, concessions are made to certain groups of old persons and disabled persons, and also to married couples where the wife contributes to the family income by work outside the family household.

To prevent tax evasion, the act stipulates that a taxpayer who returns from abroad within a year of his departure shall be considered not to have left the Netherlands, unless he has been officially resident in a foreign country during his absence.

The income that a person derives from all sources – trading profits, wages, share dividends, etc. – is included in taxable income and income tax is levied on the total in accordance with a sliding scale.

TABLE XI  
*Income tax levied in the Netherlands*  
(Rates effective from 1 July 1962)

Net income per year	Tax payable			
	Unmarried	Married, with no children	Married, with two children	Married, with four children
3,000	187	62	—	—
6,000	836	536	279	69
9,000	1,702	1,164	796	466
12,000	2,737	1,950	1,488	1,061
15,000	3,937	2,910	2,359	1,845
18,000	5,306	4,048	3,421	2,815
21,000	6,803	5,326	4,643	3,978
24,000	8,403	6,705	5,981	5,273
27,000	10,082	8,168	7,407	6,660
30,000	11,823	9,694	8,906	8,131

A withheld tax or wage tax (loonbelasting) is levied on wages and salaries as an advance on income tax. At the final assessment – if the amount of the wage, salary, etc., requires such an assessment – the amount of wage tax paid is deducted.

#### *Capital tax (Vermogensbelasting)*

The following persons are subject to capital tax:

1. resident individuals on their entire net property, wherever situated;
2. non-resident individuals on their net property situated in the Netherlands.

Property is understood to comprise everything having a monetary value. The rate of tax is 0.5%<sup>1)</sup> of the value of the net property. The following amounts are exempt from tax:

for a single taxpayer	fls 22,500
for a married taxpayer	fls 30,000
for each child of a resident taxpayer	fls 7,500

#### *Personal property and rental tax (Personele belasting)*

This tax is levied on the basis of the rental value of dwelling houses and the value of the furniture therein. The tax is collected from the tenant.

Rates: 3.8% of the annual rental value less a certain deduction;

1.5% of the value of the furniture less fls 300. (Normally this is reduced by from 2% to 1.4% for each child of the taxpayer.)

<sup>1)</sup> For the years 1958–1961 the rate was 0.6%.

#### *Estate, transfer and donation duty (Successierecht)*

The duties are collected from the person who inherits or receives something from the estate of a resident of the Netherlands through the latter's death, or who receives something from a national of the Netherlands or who inherits or acquires by donation from a non-resident real property situated in the Netherlands. The duties are in proportion to what has been acquired.

#### **Taxes Applicable to Both Companies and Individuals**

##### *Dividend tax (Dividendbelasting)*

This tax is levied on the dividends of shares, profit-sharing notes and profit-sharing debenture bonds issued by companies resident in the Netherlands.

The rate of taxation is 15%; the tax is withheld by the distributing company. However, dividends paid to resident companies or to mutual insurance companies are not subject to tax, provided that the recipient company and the distributing company did not have mutual shareholdings for 25% or more of their paid-up capital during the preceding twelve months.

Usually the dividend tax is credited against the income tax or the company tax due from the share-holding individual or company. If, however, there is no tax liability for these taxes, the dividend tax is not paid back except in a few cases not covered here. Under the treaties concluded between the Netherlands and several other nations to prevent double taxation, foreign shareholders need in general pay neither income tax nor dividend tax in this country on the dividends they receive.

##### *Directors' tax (Commissarissenbelasting)*

On income derived from the directorship of a company a 30% tax is payable on the first fls 5,000 (after exemption of the first fls 1,000), and 50% on amounts exceeding fls 5,000. The remainder of the income (after deducting this tax), together with the income from other sources, is subject to normal income tax.

The company is required to withhold this tax. Income from the directorship of a company is regarded as a cost of production of that company, and is consequently deductible from profit.

##### *Real estate tax (Grondbelasting)*

This is levied from owners of real estate in the Netherlands. Rate: 1/4% per year of the sales value of the property.

##### *Sales or turnover tax (Omzetbelasting)*

The tax is levied upon delivery of goods by a manufacturer or trader either to another manufacturer or trader or to a consumer. No tax is levied upon delivery of goods by the retail trade to consumers. The rendering of services for payment and the importation of goods are also subject to this tax.

#### *Import duties (Invoerrechten)*

The Benelux countries apply a common tariff to merchandise on importation into their territories. This tariff forms an integral part of the Benelux Customs Agreement.

Goods obtained in the open market from the customs territory of one of the three Benelux countries are not subject to import duty when imported into a Benelux country.

The rates of duty in the common tariff are very moderate.

In accordance with the provisions of the EEC convention, the Benelux tariff is being gradually adapted to the joint EEC tariff. The first adjustment took place on 1 January, 1961, for industrial goods. The tariff is being gradually abolished for goods from EEC partner countries. On 1 January, 1962, the latter tariff was reduced for most goods to 60% of the original Benelux tariff.

##### *Excise duties (Accijnzen)*

This form of duty is only levied on a few articles – wine, beer, spirits, tobacco, sugar and petroleum products. In the case of exportation or re-exportation the excise duty is generally refunded.

##### *Other taxes*

In addition to the forms of taxation specifically mentioned above, there are a number of taxes with a low rate. The most important of them are as follows:

##### *Stamp duties (Zegelrechten)*

Revenue stamps must be affixed to documents of commercial value, such as policies, consignment notes, dock warrants, stocks, bills of exchange, etc. and to written contracts.

##### *Registration duties (Registratierechten)*

For certain legal procedures it is required that the deed drawn up be registered by a civil officer appointed for the purpose. The registration is usually subject to a certain amount of duty, as, for instance, in the case of the conveyance of real estate, the purchase or founding of limited liability companies (naamloze vennootschappen) and the insurance of shares by companies.

##### *Motor Vehicle tax (Motorrijtuigenbelasting)*

The amount of this annual tax depends upon the weight and the type of vehicle.

##### *Miscellaneous*

A number of less important taxes are levied by local authorities (provincial, city and water boards) e.g. road, frontage and canal tax (wegen-, straat- en vaartbelasting).



The Netherlands is also continually striving to conclude agreements for the avoidance of double taxation.

Conventions for the avoidance of double taxation exist between the Netherlands and Belgium (20 February, 1933); Hungary (15 November, 1938); The United States of America (29 April, 1948); The United Kingdom (15 October, 1948); France (30 December, 1949); Norway (29 December, 1950); Switzerland (12 November, 1951); Sweden (25 April, 1952); Finland (23 December, 1955); Italy (24 January, 1957); Denmark (20 February, 1957); Canada (2 April, 1957); and Western Germany (16 June, 1959).

In addition, the Netherlands tax legislation includes unilateral rules for preventing double taxation on income and capital, but these are only applied if the prevention of double taxation is not provided for in any other way. Exemption from income tax, company tax and capital tax on the basis of these rules is granted in respect of certain net proceeds or assets.

## Industry in the Netherlands and its Development

Ever since the 17th century industrial undertakings of considerable importance have flourished in the Netherlands; in fact, in 1900 about 30 % of the working population were engaged in industry. Yet Holland could hardly be termed an industrial country. It was trade, shipping and agriculture that occupied the forefront during these centuries, each being an independent source of economic activity. The industries that existed, such as shipbuilding, engineering and transport, food, drink and tobacco and various finishing and processing industries, were closely allied to these three primary means of obtaining a livelihood. The textile industry, which dates from the first half of the 19th century, is an example of an important branch that differs in character from its allied industries.

The processing of agrarian products, both home-grown and imported, and the finishing of imported semi-manufactured industrial goods were characteristic of the industrial pattern of the Netherlands. Most of the products of the processing and finishing industries were intended for the home market. This is clearly shown by the figures for Dutch exports; more than one half of the total volume of exports consisted of food, drink and tobacco and only one third were manufactured goods.

### Development in the Inter-War Period

During the period between the two World Wars a gradual change became apparent in the industrial structure of the country, and although this change did not as yet make any fundamental difference to the prevailing industrial pattern it did foreshadow the phase that was to follow. In this connection particular mention must be made of the establishment of the steel works at IJmuiden. In its early stages this industry also fell within the category of processing industries – iron ore was imported and pig iron exported – but the foundation had been laid for the heavy metal industry that developed there at a later date. The same can be said to a certain extent of the chemical plant that was put into operation by the coal-mining industry for the production of nitrogen. The progress that was made in the electrical industry had an important influence on the consumer goods and machines sector because it paved the way towards the leading position which Dutch industry now holds in this sector. Another important development was the establishment in the nineteen-twenties of factories for the manufacture of artificial fibres.

To a certain extent the industrialisation process was promoted in the Netherlands by the economic depression that set in after 1929; progress was made in spite of the difficulties experienced at that time in finding markets for products. Because it was difficult to sell goods abroad it was necessary for steps to be taken to stimulate domestic activities and in this way an impetus was given to the introduction of new industrial activities. Active encouragement was given by the Government to these new ventures. It was at this time that the first expansion, the addition of a steel sheet rolling mill, took place at Royal Dutch Steel Works. Many industrial firms increased the number of their manufacturing processes and so grew into



larger and sounder industrial concerns. A few figures will show more clearly the progress that was made at this time: the number of workers engaged in industry rose from 36.9% in 1920 to 37.9% in 1930 and 39.9% in 1938; industrial production increased by 40% during the period from 1926 to 1938 in spite of marketing difficulties. Needless to say, the war years brought with them stagnation and retrogression as a result of dismantlement and war damage.

#### Post-War Developments

After the war the economic development of the country was governed by the need for national reconstruction. The restoration of productivity was of prime importance. But recovery was soon coupled with expansion; in many cases recovery also meant increased capacity. In addition to this activity, however, the initiative was taken of setting up new industrial enterprises. One of the first enterprises to be put into operation after the war was the automobile tyre factory that began working in 1946.

The recovery and growth of industry in the Netherlands was, of course, in the first place promoted by the great demand for products at a time when there was only a limited output from other countries; industry benefited especially from the fact that Germany was temporarily no longer in a position to provide industrial products for export. There were important reasons, however, for the further vigorous stimulation of industrial productivity. Measures had to be taken to ensure that industrial growth would be continued and maintained when industry had recovered from the effects of war and made up the ground it had lost in recent years. In the first place the annual 2% increase of the population made it necessary to create more employment for workers in industry. Consideration had to be given to the fact that unemployment had already existed before the war and that during the war there had been a further increase in population but fewer opportunities, of course, for employment in industry. The transfer of sovereignty to Indonesia in 1949 also helped to aggravate to a considerable extent the problem of unemployment because Netherlands activities in that country gradually ceased. Emigration to other countries, which was actively encouraged by the Government, brought some relief.

A second motive for further industrial expansion was the change that had taken place in the structure of the Netherlands balance of payments after the war. A deficit had been brought about partly by the reduction of income from foreign investments, some of which had been liquidated to finance post-war reconstruction, and partly by the demand for an increased volume of imports, now needed because of the growth of the population. In addition to these setbacks there were the losses sustained through the deterioration of economic relations with Indonesia, which ended finally in a complete rupture. As a result the Netherlands lost an important market for its products; in 1938 about 9% of the total amount of Netherlands exports had gone to Indonesia. A drive to increase the volume of exports of goods and services was essential in order to overcome the deficit in the balance of payments. The changes that had taken place in the international economic structure also made it necessary to adopt a new approach to the development of external trade.

#### Industrialization Policy

All these circumstances caused the Government to draw up in 1949 a programme for the industrialisation of the country. By then the initial stages of the economic recovery had been

passed and in some respects pre-war conditions had been restored. The Government's programme was directed, in the first place, towards meeting the primary needs of the country's economy: the provision of full employment and the restoration of equilibrium on the balance of payments. It aimed to accomplish this through industrial expansion. The lines to be followed in order to realise these objectives were also indicated in the programme. The Government's policy was directed mainly towards the full expansion of private enterprise. It followed broad lines and set out to create favourable conditions for participation by private enterprise in the industrial activities of the country. One of the conditions considered necessary by the Government was that there should be a favourable competitive position on the international market. This was attained not only by means of increased productivity but also because, with the co-operation of employers' and workers' associations, it was found possible to maintain price and wage levels that were relatively low compared with those of other countries. It was also considered that Government interference in the economic life of the country should be kept to a minimum, and that trade policy should be directed towards the liberalisation of goods in all countries.

Another objective of the Government's policy was the improvement of technical conditions in general. Technical education and training were to be extended and adapted to meet new needs; power supplies were to be increased and research was to be encouraged. Certain fiscal facilities were to be made available in order to stimulate investment in industry; these included an accelerated depreciation rate for business assets and a tax rebate for investments at 5% for two years.

The part played by the State in the financing of industrial development was restricted to participation in certain financing agencies which gave credit to sound business concerns who were not able to obtain funds through the normal channels. On one or two occasions the Government contributed part of the capital direct when it was needed for an industrial undertaking (the State Mines or the rolling mill and tinplate works at IJmuiden), or it provided a guarantee. In this way it made possible the establishment of a soda factory in one of the northern provinces. In such case flourishing industries have been the result and these industries continue to develop satisfactorily without any further assistance from the Government.

#### Distribution of Industry

The Government's industrial policy is particularly concerned with the distribution of industry, a problem that came very much to the fore in the nineteen-fifties. A few facts with regard to this matter are given here.

Most of the industry of this country is concentrated in the western coastal area. This part of the country, with its great ports and harbours, has become so popular with industrial concerns that it is feared there will in time be insufficient room for those industries whose operation depends upon proximity to a seaport. There has indeed been a growing tendency during the last ten or fifteen years to establish new industries in the inland provinces and to move some existing industries from the West to other parts of the country.

For many firms the need to establish their factories in the congested coastal areas has been alleviated by virtue of modern means of communication and transport. This country has an excellent and extensive network of roads, railways and waterways serving every district, the



development of which has been encouraged by the Government because it helps to lessen unemployment in districts where there was formerly a lack of industry and it enables space to be reserved in the coastal areas for the industries that must have deep water channels. Many measures have been taken by the Government to encourage a more even distribution of industry and to create favourable conditions for the establishment of industries in other parts of the country. Industrial sites have been made available, transport and communication facilities have been extended and housing conditions have been improved. Building subsidies are granted in cases where factories are set up in certain localities that have been selected by the Government.

### Results

Industry, both employers and workers, responded readily to the opportunities offered by the Government, and great efforts were made by the people of the Netherlands to make the industrialisation successful.

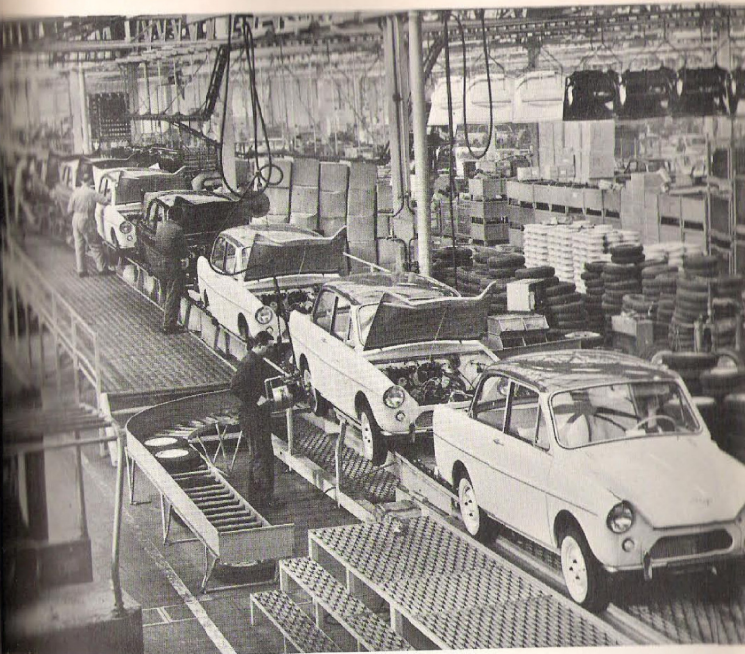
By means of concerted efforts Netherlands industry was put on a much broader basis than formerly. Its pattern underwent an important fundamental change. The structure of industry was no longer of the horizontal type that results from the division of industrial activities but was developed to a considerable extent along vertical lines by the establishment and expansion of heavy industry in both the metal and chemical sectors. The production of iron and steel was increased and new rolling mills were set up. A very extensive plant for the production of chemicals from petroleum was constructed, and the chemical industry associated with the production of salt and coal underwent a major expansion. In addition to these enterprises there were also increased manufactures of products like electrical apparatus and machines that are needed for the production of other goods. The Netherlands gained more independence as an industrial country as a result of this widespread expansion. There was also increased productivity in the consumer goods sector brought about partly by the establishment and expansion of allied industries. The industrial growth consisted mainly in the increased production by the metal, chemical and associated industries, but there was also a higher output in other branches such as the paper industry.

The number of new industrial undertakings established through Dutch initiative averaged one hundred a year. Industrial production as a whole and the production per worker increased each year: on the basis of 1938 = 100, the index figures for 1961 were 258 and 147 respectively.

Annual net investments in fixed assets rose from 60 million guilders in 1938 (pre-war prices) to 4,980 million guilders in 1961 (1961 prices). The 1961 figure was equal to about 13.5 per cent of the national income.

The contribution of industry to the national income is also evidence of the success of the industrial policy. In 1938 this amount was 31 per cent and it rose to 42 per cent in 1961. By that time there had been an increase of 600 per cent in the total national income. The improvements brought about by the industrialisation programme are also reflected in the larger share now taken up by industrial products in the composition of Dutch exports. Whereas in 1938 this amounted to 63 per cent of the total volume of exports, by 1960 it amounted to 82 per cent. At the same time the total volume of exports had trebled.

The establishment of foreign industrial undertakings in this country has been of especial importance.



300 DAF car bodies move along a 565-metre-long assembly-line from the coachwork to the spraying and finishing departments.



tance for the growth of industry. Since the end of the war 255 undertakings have been established in this country by foreign industrial firms and 188 foreign firms are cooperating with Dutch industrial organizations, thanks to the policy of non-discrimination between Dutch and foreign investors; the foreign entrepreneur now has the same rights and obligations as his Dutch colleague. Foreign firms are attracted by the industrial climate in this country and by factors such as its advantageous geographical position, industrious and growing population, and social and political stability, all of which favour the establishment of industrial undertakings. The founding of these foreign enterprises was important to the Netherlands not so much on account of the capital they brought into the country and the possibilities they opened up for more employment (both directly in major industries and indirectly in allied industries), but more especially on account of the additional technical knowledge and experience that was brought with them. Certain goods that had never been manufactured in the Netherlands before were now included in the Dutch range of products as a result of this introduction of foreign enterprises. The manufacture of office equipment was a case in point. Among the foreign firms that established enterprises in the Netherlands were manufacturers of calculating machines, oilburners, automobile tyres, lift-trucks, heating installations, textile machinery, machine tools, equipment for the exploration and the exploitation of petroleum, and of numerous chemical products and textiles.

#### Research

To promote increased productivity in Dutch industry constant attention is given to the possibilities of mechanization in factories and the use of automation. Much is also being done to encourage scientific research and development. Research is not exclusively carried out in the laboratories of very large companies and in universities; medium-sized and small firms also have their research laboratories and workshops. But many of the firms in the last two categories do not have the benefit of these facilities and for them the special research institutes, notably the Netherlands Organization for Applied Scientific Research (Nederlandse Organisatie voor Toegepaste Natuurwetenschappen) are of great importance.

The particular function of this organization is to carry out research on behalf of the smaller and medium-sized industrial firms. The central organization coordinates the work done by four subsidiary organizations that conduct specialised research, and one of these, the Industrial Research Organization, is of special importance for industry in this country. Several institutes are combined in this organization and they are all engaged in research work such as investigation of certain materials, branches of industry or industrial processes.

The Organization and its institutes undertake research work commissioned by individual companies or by a group of firms with similar interests, who have sometimes joined together to form a research association. They also carry out research on their own initiative.

The Organization is sponsored by the Government and receives considerable financial support from the Exchequer.

The amount of money spent on research and development in 1959 was estimated by the Central Statistical Office to be about 550 million guilders. This sum relates only to research and development work carried out in the fields of natural science and technology. It is equal to more than 1.6 per cent of the national income.



*In late years the Hydraulics Laboratory has received many research orders from abroad.*



A little more than 73 per cent of the research and development work carried out in the Netherlands, (not including that done in universities), was conducted by private industrial concerns, 15 per cent by the Organization for Applied Scientific Research, and nearly 12 per cent by other research institutes. 33,000 people are engaged in this research and development work.

#### Netherlands Industry and the European Common Market

The establishment of the European Common Market did not fail to have an effect on industry in the Netherlands. With the enlarged markets that were made available new possibilities were created for the further increase of industrial production. The figures for Dutch exports to E.E.C. countries show clearly the effect of the larger markets on the economic development of the Netherlands: in 1948 Dutch exports to these countries amounted to 41.5 per cent of the total volume of exports and in 1961 they amounted to 47.5 per cent. It was expected, at first, that when the Euromarket came into effect certain industries would be enlarged but that others would have to cut down their production or, in some cases, close down altogether. The influence of the Euromarket has, however, manifested itself so far in quite a different way. Many industries have, indeed, undergone a major expansion but their growth has not coincided with the decline of industries in other sectors. Instead the Euromarket has effected an all-round expansion, though the growth in some branches has been greater than in others. It can be said that Dutch industry has expanded and, at the same time, has become more specialised. That the development which has taken place has proved to be so favourable for Dutch industry is due in the first place to the fact that Dutch industry has grown without any protection and with a relatively low rate of import duties. Moreover Dutch manufacturers, encouraged by the existence of the Euromarket, have increased their activities. Not only has Dutch industry made strenuous efforts to retain its competitive strength by continuous modernisation of its equipment, but many firms have been able, by means of fusion with other firms, to go in for more specialisation and to adapt their products to meet the demands of new and enlarged markets. In the metal and chemical industries, and also in the textile industry, it has been possible for firms to strengthen their positions through amalgamation. Some firms have cooperated with British, American and other foreign companies. One of the most important effects of the Euromarket has been the increase in the number of subsidiary companies that foreign concerns have established in this country. Its favourable geographical position, that has caused Holland to be named the gateway to Europe, has been one of the main reasons why foreign entrepreneurs decided to establish undertakings here.

We should like to add some more detailed information to this general survey.

#### Location of Industry

The main areas of industrial concentration are in the provinces of North Holland and South Holland. Amsterdam takes pride of place as the Netherlands' most important industrial centre. In addition to the industries in these areas there are also important ones in the southern provinces of South Limburg and North Brabant, in the eastern province of Twente and in the centre

of the country. In the northern provinces, where industrial activity was developed on a moderate scale and confined to only a few industries, a more vigorous expansion has now set in.

#### Raw Materials

The Netherlands produces annually about 12.6 million tons of coal, 2.0 million tons of crude oil, 449 million cubic metres of natural gas and 1,100,000 tons of salt.

#### Power Supplies

The windmills that are still to be seen in this country serve nowadays only to embellish the landscape. Their function as a source of power was taken over first by steam engines and later by the electric motor.

The amount of power consumed in the Netherlands in 1961 was equivalent to 32 million tons of coal. 46 per cent was derived from the coal-mining sector and a little more than 51 per cent from the petroleum industry.

Power supplied in the form of electricity amounted to more than 15,500 mln. kWh.; of this, 61 per cent was consumed by industry and trade.

The electricity is produced by twenty-four generating stations that are connected with each other by a national grid system. In these power stations coal, oil and gas are used for fuel.

TABLE I

Industry	Number of establishments	Total number of employees ( $\times 1000$ )	Total turnover (in millions of guilders <sup>1</sup> )	Exports
Metals	2,813	382.4	11,109	4,009
Food, drink and tobacco	1,658	154.2	10,408	2,360
Chemicals	583	71.7	5,405	2,518
Textiles	511	119.8	2,932	989
Clothing	1,123	67.7	1,332	135
Paper	253	29.8	1,242	270
Leather and rubber	545	41.2	1,080	271
Ceramics, glass and stone	647	49.3	1,106	158
Woodworking (including cork and straw-processing)	1,064	41.4	1,018	92
Printing and allied activities	817	42.3	885	66
Laundries, etc.	420	14.2	141	—
Diamond industry	19	0.7	33	26
Total	10,453	1,014.7	36,691	10,894

<sup>1</sup> 1 Dutch guilder = £ 0.20 sterling = 28 US cents.



The production of gas has also been largely centralized. The chief suppliers of gas are the collieries of the State Mines and those of the blast furnaces in IJmuiden, the natural gas exploitation undertakings in the north east of the country and those near The Hague and Rotterdam, and the oil refineries at Pernis near Rotterdam. In 1961 the total inland consumption of gas was 3,900 mln. cubic metres; of this amount about 54 per cent was used by industry. The gas deposits recently discovered in the north of the country will soon completely change the situation described on these pages.

### Survey of Industry

Dutch industry is highly diversified, as can be seen from the survey for 1960 (on page 35) which relates to establishments employing 10 or more people.

#### *The metal industry*

A modern and fully-equipped steel works manufactures pig iron from imported ores. Two steel plants, a factory making tubes, and a number of rolling mills including those for broad sheet steel, are associated with this undertaking. The annual capacity at present amounts to:

1.5 million tons of pig iron,

2.0 million tons of crude steel,

1.6 million tons of rolling-mill products (not including tin),

167,100 tons of tin.

This industry is undergoing constant expansion. Moreover, the construction of a second blast furnace is at present under consideration.

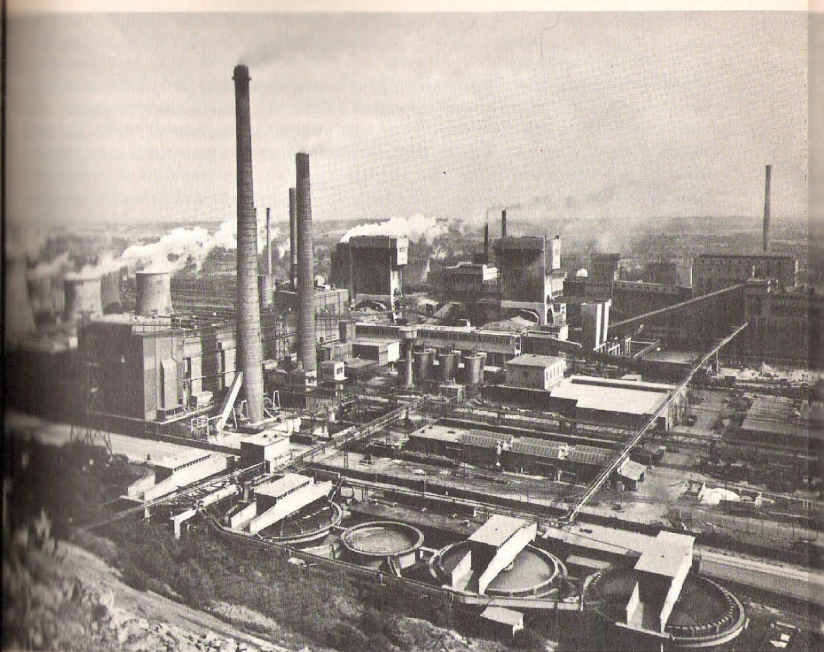
Besides the two steel plants belonging to the steel works there are two independent steel works, the combined capacity of which is about 300,000 tons a year. In addition, there are various rolling mills, wire-drawing and tube-fabricating plants as well as quite a large number of iron foundries.

In the non-ferrous metals sector Holland possesses a *tin-smelting plant* and a *zinc works*, both of which operate on imported ore. For unwrought copper, lead, aluminium and other non-ferrous metals Holland is dependent on imports; it does, however, have the necessary foundries, rolling mills and flattening mills.

A few firms specialise in the casting of ships' propellers and church bells.

*The engineering works and construction shops* occupy an important position in the iron and steel fabricating sector. Their products include steam engines, internal combustion engines, agricultural appliances, metal and woodworking machines, other industrial machinery, refrigeration plant, shop and office machines, bridges, cranes, lifts, structural steelwork, gasometers, oil refineries and complete factory installations.

Shipbuilding, an industry that has existed in this country for centuries, has pride of place in consideration of the industries that provide the means for the transport of goods and passengers. The shipbuilding yards of this country are able to carry out all kinds of specialised shipbuilding. Vessels of widely different types can be built here varying from small boats like yachts, fishing vessels, coasters and tug boats to large luxurious passenger liners, various types of cargo boats, huge tankers and dredgers. Ship repair also forms an important part of this industry. In 1960



*A view of the Maurits State Mine at Geleen.*



188 sea-going vessels (a total of 567,000 g.r.t.) were launched, an achievement that gave the Netherlands the sixth place among the shipbuilding countries. Of this tonnage 235,000 g.r.t. was built to foreign orders.

The *motor industry* is represented by a fairly large number of assembly plants and four factories for the production of motor vehicles to original designs. The manufacturing programme embraces cars, buses, lorries, trailers, semi-trailers, military vehicles, agricultural tractors and farm wagons. Holland's first post-war cars, the DAF 600 and DAF 750, both with a new automatic transmission system, are attracting great interest.

Since the war the Dutch *aircraft industry* has designed and produced training planes, a successful passenger plane (the Fokker F 27 'Friendship') and a jet-propelled helicopter. Moreover three of the four factories build fighter aircraft under foreign licence.

The *railway equipment industry* has carried out virtually the entire restoration necessitated by the wartime losses of rolling stock on the Netherlands Railways; in addition, it has exported 20 electric locomotives and motor coaches, 150 other locomotives and motor coaches, 700 passenger coaches, 19,200 goods wagons and a large quantity of spare parts.

There are more than 60 *bicycle factories* with a total production of about 600,000 pedal cycles and 250,000 mopeds. Exports of these in 1960 were 158,000 and 19,000 respectively.

There are more than 200 firms engaged in the *electrical engineering industry*, and one of them is one of the largest electrical engineering undertakings in the world. Owing to the extensive research work carried out in its laboratories this firm often plays the part of a pioneer in the field of electrical engineering and allied industries. Every variety of electric equipment, ranging from complete electricity generating plants to tiny transistors, is provided by this firm and the other firms in this sector.

The *other metal-working establishments* consist chiefly of factories for the production of metal furniture, stoves, cooking ranges and other heating appliances, wire netting, metal braiding, rails, screws, bolts, nuts, small hardware, springs, builders' fittings, household articles, kitchen and table ware, lighting equipment, tinware and tools.

#### The Food, Drink and Tobacco Industries

Large parts of these industries are concerned with the processing of indigenous raw materials. This is the case, for example, with the 500 *dairy factories*, which process some 5,000,000,000 kg (1,280,000,000 imp. gal.) of milk every year, i.e. seven-eighths of Holland's milk production. The following table shows the quantities of some dairy products made and exported in 1960.

TABLE II

	Production (in metric tons)	Export (in metric tons)	Export as a percentage of production
Butter	96,600	31,100	32
Cheese	213,300	107,900	51
Condensed milk	408,100	304,400	75
Powdered milk	103,000	43,800	43

Holland is the world's largest exporter of condensed milk and cheese, the third largest of powdered milk and the fourth largest of butter.

More than 100 *meat product and bacon factories and export butchers* process a great deal of the livestock supplied for slaughter, and export about 280,000 tons of meat products and fresh meat every year.

Over 100 *fruit and vegetable preserving factories* process about 16 per cent of the Dutch harvest and carry on a large export trade. Holland's fishing fleet provides the raw material for the manufacture of *fish preserves* (17 factories).

The entire harvest of industrial potatoes is processed by 20 *potato flour factories*. Holland is the largest exporter of potato flour in the world.

Thirty *breweries* process barley which is specially grown in Holland for brewing purposes. In 1960 Holland exported 830,000 hectolitres (18,300,000 imp. gal.) of beer and thereby became the foremost beer-exporting country.

More than 90 *distilleries*, which likewise process indigenous raw materials, export their products on a large scale to all parts of the world.

Besides the industries which process predominantly home-produced raw materials there are others which obtain their supplies largely from other countries. This is the case, for instance, with the *flour mills*, the *sugar refineries*, the *confectionery factories*, the *margarine factories* and the *bread, cake, biscuit and pastry factories*.

The 'up-grading' of raw materials of purely foreign origin takes place mainly in *cocoa and chocolate factories*, *oil refineries*, *tobacco-processing plants* and *coffee-roasting and tea-packing establishments*. All these branches of industry export on a large scale; as regards cocoa-butter and cocoa powder, for example, Holland is the largest exporter in the world.

#### The Chemical Industry

The chemical industry, which can claim the experience of centuries for some of its branches, has undergone an immense expansion in the last few decades. This is clearly shown in the figures for production: the value of its products in the years round 1940 was about 230 million guilders; at present it is about four thousand million guilders. About one half of these products is exported.

The expansion has been most marked in two fields: there has been a rapid growth in the heavy chemical industry and a large-scale manufacture of the chemicals derived from petroleum. In the course of the years the State Mines also have built up an extensive chemical industry that manufactures a large number of products based on coal derivatives; these include nitrogenous fertilisers, basic materials for the plastic industry, and scores of other products. The firm that exploits the salt deposits in the north and east of the country has also expanded its activities and now has a large chemical undertaking which produces a big range of important goods.

The growth of the petroleum chemical industry also has been impressive. Three petroleum refineries with a capacity of approx. 25 million tons per year have brought into existence an industry that manufactures a great variety of products. These include synthetic detergents, glycerine, sulphur, insecticides, basic materials for the paint and plastic industries, synthetic rubbers and fertilisers.



In the heavy chemical industry, to which the coal and salt enterprises belong, there are firms manufacturing acids, carbon black, catalysts for oil-refining, and superphosphates. There are many factories in the light chemicals sector, and together they manufacture a wide range of products that includes starch, gum, antibiotics, vitamin preparations, perfumes, essences, argon, helium, synthetic resins, printing inks and paints.

#### *The Textile Industry*

The Dutch textile industry obtains practically all its raw materials from other countries and exports about 35 per cent of its production.

The principal branches are the *cotton, rayon and linen industries*, with 150 establishments, and the *woollen industry*, with just over 90. The annual production of cotton, rayon and woollen yarns is 76,000, 35,000 and 24,000 tons respectively; the respective annual quantities of these yarns worked up by the Dutch textile industry are 84,000, 12,000 and 30,000 tons. It can be seen, therefore, that cotton and woollen yarns also have to be imported, whereas there is an exportable surplus of rayon yarns, of which Holland is the world's second largest exporter.

Other important branches are:

the *knitwear industry*, with 190 establishments,  
the *carpet and coir fibre weaving industry*, with 60 establishments,  
the *narrow goods and lace industry*, with nearly 40 establishments, and  
the *miscellaneous textile industry*, with 90 establishments.

#### *The Clothing Industry*

The clothing industry, with 1,240 establishments, supplies a large part of the home market requirements in addition to carrying on a substantial export trade, particularly in ladies' coats and gowns. Holland's exports of ready-to-wear clothing constitute about two-thirds of the imports.

#### *The Paper Industry*

Over 40 *paper mills* produce some 650,000 tons of paper a year and export about 160,000 tons. Holland is the world's largest exporter of *strawboard*, which is made in 19 factories.

#### *The Pottery Industry*

The Netherlands is known abroad for its Delft china and its Gouda and other fine pottery. It also has a good reputation for glassware and crystal. In addition there are hundreds of factories that make concrete, bricks and roofing tiles and these also are of great importance; in most cases they supply the domestic market. Other important products in this sector are technical apparatus, sanitary ware, tiles, drain-pipes and preserving jars.



*A television assembly department.*



### The Leather and Rubber Industries

Holland has 85 tanneries, 250 shoe factories, 150 leather goods factories and 110 rubber-processing plants.

The tanneries import about 60 per cent of the necessary hides and turn out approximately sufficient leather to meet the domestic demand. Dutch shoe factories produce chiefly for the home market but they also export between 5 and 6 million pairs a year.

The rubber industry's most important activity is the manufacture of tyres. These are produced by three factories with exports to the value of 56 million guilders a year. Technical products such as hoses and tubes are also manufactured.

### The Woodworking Industry

This industry, which operates almost entirely on raw materials of foreign origin and imports 3 million cubic metres (4 million cubic yards) of timber a year, consists of more than 100 undertakings, including sawmills and planing mills, carpentry works, packing material factories, factories for the production of miscellaneous wooden articles, veneer and plywood factories, furniture factories and other establishments. The industry exports considerable quantities of furniture, doors and door frames, windows and window frames, prefabricated buildings, crates, barrels, plywood, etc.

### The Printing and Allied Industries

Holland's printing and allied industries have a particularly good reputation. There are over 650 printing works and 100 bookbinding establishments. Many foreign books, magazines, postage stamps and negotiable documents are printed in Holland.

### The Diamond Industry

The Dutch diamond industry suffered serious losses during the Second World War, but Holland is still one of the most important centres for the cutting and further treatment of these precious stones and also for their manufacture into diamond jewellery and industrial diamonds.

### Production and Productivity

Since 1938 industrial production in Holland has increased by 158 per cent and the productivity of the workers by over 47 per cent. This trend is still continuing.

### Exports of Industrial Products

The expansion of Dutch industry necessitates increased imports of raw materials, and in order to be able to pay for these Holland must regularly step up its exports of industrial products. That it has succeeded in doing so can be seen from the following figures.

The export percentages show that Holland is not, as many people think, a predominantly

agricultural country, but that it relies to a great extent on its industrial production. More than 43 per cent of the Dutch national income is derived from the industrial sector<sup>1)</sup> and 42 per cent of Holland's working population of 4.4 million is employed in industry.

TABLE III  
Exports of industrial products (including semi-manufactures)

	1957	1958	1959	1960
	(in millions of guilders)			
Metals and metal goods	2,740	3,119	3,591	4,158
Foodstuffs, beverages and tobacco products	1,877	1,876	2,097	2,194
Textiles	885	938	1,029	1,157
Chemical products	1,000	1,036	1,211	1,279
Clothing	129	137	149	166
Paper and cardboard	198	202	221	247
Pottery and glass	89	100	129	194
Leather, leather goods and rubber products	144	157	198	204
Wood and wooden articles	55	66	81	98
Products of the printing and allied trades	68	118	85	89
Diamonds	108	98	146	129
Fuels	1,572	1,488	1,324	1,614
Miscellaneous industrial products	822	791	909	1,037
Total	9,687	10,126	11,170	12,566
Percentage of total Dutch exports	82.3	82.7	81.5	82.1

<sup>1)</sup> Including the mining and building industries and public utilities.

## The Development of Nuclear Energy in the Netherlands

The Committee for Nuclear Industrial Development, established by the Minister of Economic Affairs on 22 April, 1960, issued some time ago a report on industrial development in the nuclear reactor field. In the report the Committee concludes that, 'although it is uncertain when nuclear energy will be used on a large scale, important sections of industry in the Western countries are sure to bear the stamp of nuclear production in the not too distant future'. For this reason the report urges that the national industry endeavour to obtain in the nuclear reactor field a position worthy of its central place in the national economy and appropriate to the role it will be required to play in Europe.

The orders from international reactor projects and foreign research institutes which are being received by Netherlands firms are proof of the confidence felt in the achievements of Netherlands industry. These orders concern products and components which have been developed by the firms in question on their own without any Government support. The technical progress made by the national industry in the nuclear field during the last few years is encouraging. Moreover, a basis has been laid for efficient co-operation between several enterprises by the establishment in 1959, of 'Neratoom', a combination of prominent firms, which will be discussed later in this survey.

The research basis laid in this country in previous years and to be expanded and consolidated in the years to come will help the Netherlands to occupy a worthy position in the field of nuclear energy.

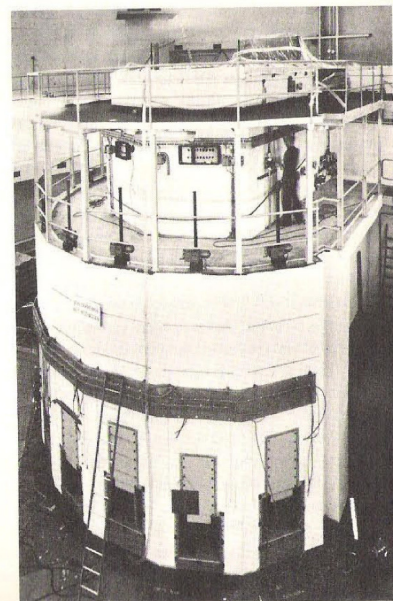
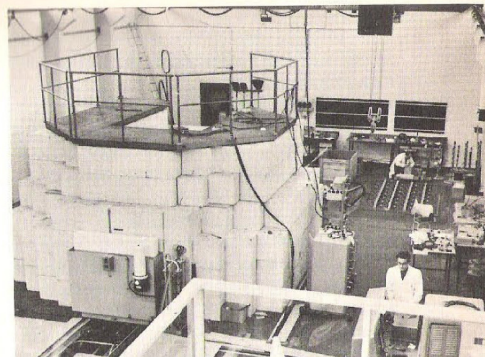
The following is a survey of the research programmes in the nuclear energy field being carried out in the various institutes engaged in nuclear research.

### *Netherlands Reactor Centre*

The central research institution in the field of nuclear reactors is the Netherlands Reactor Centre (R.C.N.), a foundation in which are represented the Netherlands Government, the 'Maatschappij tot Keuring van Electrotechnische Materialen' - K.E.M.A. (Society for Inspection of Electrotechnical Materials), the 'Stichting voor Fundamenteel Onderzoek der Materie' - F.O.M. (Foundation for Basic Testing of Materials) and a group of some 50 large Netherlands concerns. The Centre is financed by the Government, K.E.M.A. and trade and industry. Although it was established as recently as 1955, some of its activities started earlier, the first dating from 1951, when a 350 KW research reactor at Kjeller, Norway, became critical with fissionable material furnished by the Netherlands, which has since been the basis of the joint research work there.

The first permanent research reactor on Netherlands soil did not become critical until September 1960. It is a 10 KW reactor of the Argonaut type on the R.C.N. site near Petten. Following a period of reactor-physical measurements, this Low Flux Reactor (LFR) is now in daily use for simple radiation, physical experiments and the training of staff for the Centre itself and for other institutions.

*The Argonaut-type reactor is screened off with concrete blocks.*



*The Low-Flux-Reactor at Petten which has been in operation since September 1960.*



Much of the work done by the Low Flux Reactor served to prepare the way for the HF (High Flux Reactor), a 20 MW research and material-testing reactor of the aquarium type, with a neutron flux of  $2 \times 10^{14}$ , which became critical on November 9, 1961. For a number of months the reactor operated at low power; the power was gradually increased to the maximum of 20 MW. Samples of steel and uranium oxide and other substances are subjected to core radiation (in co-operation with IFA, the Norwegian sister organization). Moreover, graphite radiations are carried out in connection with the DRAGON project<sup>1)</sup> at temperatures of 600°, 900° and 1200° Centigrade respectively. The neutron beams from the reactor are used for nuclear physics research (all in co-operation with university laboratories) and for research on various kinds of solids (with Norwegian participation).

Apart from these two reactors, Petten has a laboratory building with facilities for radiochemical work and a number of hot cells for handling highly radioactive objects. Meanwhile, construction has begun on a laboratory with concrete cells for the same purpose. The chemical laboratory also has a plant for producing small quantities of uranium oxide tablets for research purposes.

This research is part of a programme for developing a small reactor of high specific power of the pressurized-water type. In all, this project comprises 16 separate research and development projects, including the setting up of critical apparatus at Petten. This is a reactor core which remains at zero power, one of its purposes being to study the effects that will occur in a projected reactor. This apparatus, which is called KRITO, became critical on 28th March 1963.

Additionally, a reactor for agricultural research has been designed on behalf of the 'Instituut voor de Toepassing van Atoomenergie in de Landbouw' - ITAL (Institute for the Application of Atomic Energy in Agriculture) which was built under R.C.N. supervision and became critical on 9th April 1963. A small research reactor has also been designed for the Delft Institute of Technology. The R.C.N. is working, jointly with the T.N.O., on an Ultra centrifuge for separating uranium isotopes.

The R.C.N. co-operates with the Norwegian 'Institute for Atom Energi' (IFA). Since 1959 this co-operation has been centred in a number of joint research projects - those at Petten have already been mentioned. One of the projects in which the R.C.N. is taking part at Kjeller consists in an attempt to reprocess uranium that has been used as fuel. Another one is running a Netherlands-Norwegian reactor school which was established in 1958.

In connection with European co-operation in Euratom, an important event with which the Netherlands Reactor Centre is closely associated is worthy of mention; namely, the conclusion of an agreement between the Netherlands Government and the Euratom Commission on July 25, 1961. Under this agreement Euratom will be granted a long-term lease of a 25 hectare site adjacent to the R.C.N. site. Euratom intends to erect on this site necessary plant and buildings for a research centre of its own.

The agreement provides further that the activities of the Euratom centre shall be concentrated primarily on the use of the High Flux Reactor. The R.C.N. has transferred ownership of this reactor since completing the tests. For a period of four years after the transfer the Netherlands Reactor Centre will be responsible for the management of the reactor, and the Netherlands programme will have priority in the use of the High Flux Reactor during this period.

The operation costs of the reactor as from the date of transfer (1 November 1962) are for the account of Euratom. The R.C.N. pays Euratom a fee in return for the experiments it undertakes in the reactor.

<sup>1)</sup> See later in this article.

The Netherlands, in its turn, will make an investment of approximately 28.8 million guilders in the Euratom centre. This amount includes the value of the High Flux Reactor with its buildings and auxiliary plant. The Euratom Commission will invest some 36 million guilders in the centre.

The Euratom centre at Petten will be autonomous. The Euratom Commission intends to carry out at Petten a programme of investigation in the fields of physical chemistry, metallurgy and technology. It is planned to establish laboratories there in the first place to study problems connected with thorium reactors, in particular the development of fissionable material elements with a very high burn-up, and the technology of radiation circuits. This will be done in close co-operation with the DRAGON project, an international project of the European Nuclear Energy Agency (of the OECD), in which Euratom is participating, for developing a high-temperature gas-cooled reactor at Winfrith Heath in the United Kingdom.

In addition, the Netherlands Reactor Centre has concluded two further important contracts with Euratom. The first concerns the development of the aforementioned pressurised water reactor of high specific power, which is suitable for the propulsion of ships. Euratom is participating in this project with an investment of up to a maximum of 6.8 million guilders, which is 40 per cent of the total cost. The development programme can be divided into various types of project: firstly, those to be carried out by the R.C.N.; secondly, those to be undertaken by industry; and, thirdly, those that are most suitable for the Technological Universities. This contract covers a period of three years and allows for a possible extension.

A second contract with Euratom concerns research work in the field of transplutonium elements.

The research that the R.C.N. is carrying out at Euratom's expense under this contract will take two years. It comprises six objects of study; principally: research on methods of separating transplutonium elements, such as americium and curium, from the waste products of reactors, methods of determining such elements, the nuclear properties of some of these elements and their possible technical and scientific applications.

The R.C.N. is carrying out this research in the Petten centre.

#### *The K.E.M.A.*

The 'Maatschappij tot Keuring van Electrotechnische Materialen' (K.E.M.A.) of Arnhem is carrying out, in partnership with R.C.N. and Euratom, research and development work to ascertain the possibilities of construction of an aqueous homogeneous suspension reactor. This is a type of reactor in which circulates uranium oxide or thorium oxide in suspension. The suspension also serves as a moderator and coolant. One of the advantages of this type of reactor is its ability to breed fissionable materials when using thorium. The development of this reactor has been the first step taken by the Dutch towards the development of their own types of power reactors.

The object of the research is to study the properties of oxidic suspensions for use in nuclear power reactors. To this end a 'zero power reactor' was built, which has yielded very valuable reactor-physical information. A small 250 KW reactor was also built for this purpose (the KSTR: K.E.M.A. suspension test reactor). Since it is intended to use the proposed reactor in a system whereby the fission products will be continuously or semi-continuously removed, much research work has already gone into the preparation of this system at Arnhem. Euratom showed its



interest in this research by concluding a three-year association contract with the K.E.M.A. on 1 July, 1959, which has meanwhile been extended. Euratom has seconded some members of scientific and technical staff to the project.

#### *The F.O.M. Institute*

Another institution engaged in nuclear energy research – though not exclusively – is the 'Stichting voor Fundamenteel Onderzoek der Materie'. Its field of study comprises, in the main, nuclear physics, mass separation and analysis, research on metals, molecular physics and research on thermonuclear reactions. Its research is carried out, for the most part, in three model laboratories of its own, the remainder being undertaken in university laboratories. The latter work will be discussed further in this article.

The F.O.M. Laboratory for Mass Separation specializes in research on the separation, analysis and chemistry of isotopes and on gas discharges.

Following an order placed for the DRAGON project<sup>1)</sup>, research is being conducted into high pressure thermodiffusion for the purification of reactor cooling gas (helium).

The F.O.M. Institute for Plasma Physics is engaged in experimental and theoretical research on plasma physics and gas discharges, including the production, heating and confining of plasma, the movement of plasma and the reaction of plasma to high-frequency electromagnetic fields.

The 'Instituut voor Kernfysisch Onderzoek' – I.K.O. (Institute for Nuclear-physical Research) an institute established by F.O.M., the Municipality of Amsterdam and Philips Industries is carrying out research in the fields of nuclear reactions, nuclear spectroscopy and radiochemistry, partly with the aid of the cyclotron which it possesses.

#### *Netherlands Central Organization for Applied Scientific Research*

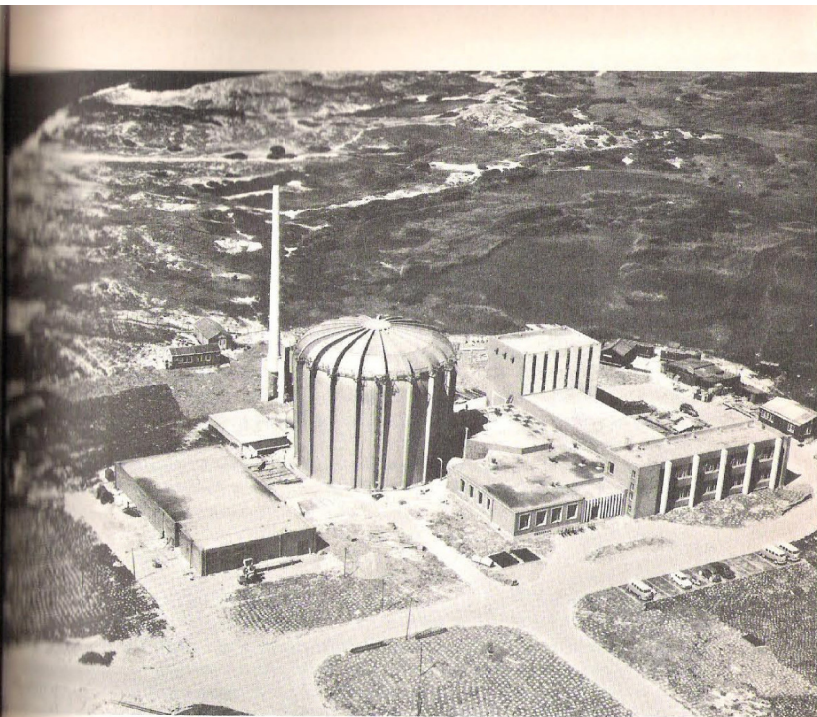
The Netherlands Central Organization for Applied Scientific Research known as the 'T.N.O.' (an abbreviation of the Dutch words 'Toegepast Natuurwetenschappelijk Onderzoek' (applied scientific research)), is active in many fields. It also engages in nuclear research and development including the application of isotopes. It is doing work for Euratom in the reactor field, experimenting principally on the transmission of heat by organic fluids. This is for the benefit of the ORGEL project, in which an organically cooled reactor moderated by heavy water is being developed in the Euratom Centre at Ispra (Italy). Basic research is also being carried out on the wall-to-pipe transmission of heat in connection with gas-cooled reactors.

In the field of radiobiology, research is being carried out on animals (including monkeys) in order to test the effectiveness of bone marrow transplantation in treating radiation disease. Special attention is also being given to the serious secondary disease occurring after such transplantation which affects both humans and monkeys. This research is being carried out in co-operation with Euratom. Another project which is being undertaken in co-operation with Euratom aims to produce specifically pathogenetically free laboratory animals (rats).

In addition, the toxic effects of certain dangerous radioactive materials are being investigated, special attention being given to the increase in tumour frequency following internal infection. Attempts are being made to find new methods for treating such infections.

Much attention is being given to the study of the mechanism of radiation damage to living cells.

<sup>1)</sup> See later in this article.



Aerial photo of a part of the Petten Nuclear Research Centre. The dome of the High-Flux Reactor can be seen in the middle of the photo.



The results may well prove of more value for determining the consequences of the exposure of humans to very small radiation doses than extrapolation from results obtained with laboratory animals.

Furthermore, the T.N.O. is developing methods for the dosimetry of ionizing rays, methods for gammagraphy (e.g. of the liver or the brain) and a device for measuring radioactivity within the human body.

Research into the genetic effects of radiations is also being conducted in co-operation with university institutions.

Euratom has recently concluded several contracts with the T.N.O. including:

A first contract, for which the U.S. Atomic Energy Commission is providing half the funds, concerns research into the brittle quality of steel that has been subjected to radiation within a nuclear reactor.

A second contract for research on behalf of the Euratom Centre at Ispra (Italy). While the new experimental ESSOR reactor for studying the ORGEL channel was being designed, a number of problems arose. Five of the problems, one of them involving the investigation of abrasion at a temperature of 400° Centgrade, have been submitted to T.N.O.'s Organization for Industrial Research.

A third contract concerning the development of a method that will make it possible to analyse during the process the composition of an organic material, in its role as a coolant, in certain reactors.

#### *The ITAL Institute*

The 'Instituut voor Toepassing van Atoomenergie in de Landbouw' (ITAL) is concerned with adapting nuclear science to agricultural research. It co-operates closely in this with other specialised institutes for agricultural research and with the Agricultural University of Wageningen. This field of research comprises improvement by mutation, the manifold uses of isotopes in research on plant physiology, phytopathology, soil science, entomology, food preservation, the accumulation of radioactive elements in the soil and plants, etc.

The Institute is still in the process of construction and is expected to be finished in 1964. It already has its own isotope laboratory; the building of a radiobiological laboratory has reached an advanced stage, and the construction of a radiochemical laboratory is in preparation. As already mentioned under the activities of the Netherlands Reactor Centre, the research reactor has recently become critical. It is of the aquarium type and generates 100 KW. (The BARN reactor: Biological Agricultural Reactor Netherlands.)

Euratom and ITAL concluded an association contract in 1961 for co-operation in the agricultural sphere.

Two-thirds of the expenditure involved in the implementation of the contract, up to a maximum of 5.4 million guilders a year, will be borne by Euratom; ITAL will bear the remaining third. Euratom will further contribute by providing about one half of the scientific staff to carry out the research. The contract covers a period of 20 years and permits the making of subcontracts for research on specific topics and the making of contracts for research work in other Euratom countries.

The extensive activities for which this association contract provides will make the Institute an

important centre of the Community's activities in the adaptation of nuclear energy to agriculture.

On two occasions in 1961 ITAL acted as host during courses organized under the auspices of the International Atomic Energy Agency and FAO 'to train participants to use radioisotope techniques in the study of the relations between soil and plant in agricultural and forestry research. The courses were attended by 30 students.

#### *Delft Reactor Institute*

The 'Reactor Instituut' at Delft, an inter-university institute, has a 100 KW aquarium reactor designed and built, for the most part, in the Netherlands. Besides the reactor, the Institute has three laboratories for research in the related physical, chemical and biological fields. Research is already going on in the fields of neutron physics, reactor shielding, reactor technology, radiation chemistry and activation analysis.

#### *Institute of Radiopathology and Radiation Shielding, Leyden*

This institute is doing research work with radioactive isotopes and ionizing rays, often in co-operation with other laboratories, into such spheres of study as bone-marrow transplantation, mutation, induction and the mechanism of partial repair of primary radiation damage in cases of *Drosophila melanogaster*. In addition, it carries out research into the effect of radiation on the genetic material of micro-organisms.

#### *Eindhoven Institute of Technology*

The Eindhoven Institute of Technology has a laboratory for Heat Technology, with equipment for investigating the exchange of heat insofar as it is important for nuclear reactors. Special attention is being devoted to gas and water in their role of coolants.

As regards the gas-cooled systems, a few sets of apparatus for low pressures and low temperatures are in operation, and a circuit for very high pressures and very high temperatures is being built.

The research into the transfer of heat and the stability of boiling-water reactors, which is being carried out in the laboratory, is based on the preparatory work carried out in the Netherlands (for the Halden reactor<sup>1</sup>). The Eindhoven institute also has an association agreement with Euratom for conducting research into the transfer of heat in boiling-water reactors.

Finally it should be mentioned that the Institute has a high-pressure water circuit for research on heat transmission in PW reactors.

#### *Delft Institute of Technology*

In co-operation with the Neraatom Company and the Royal Netherlands Navy, the Delft Institute of Technology is engaged in extensive research into the dynamic behaviour of a 'pressuriser' for a pressurised-water reactor (Neptune Project). This involves, for one thing, extensive research into large thick-walled pressure vessels, applying the latest methods in the

<sup>1</sup> See later in this article.



field of tension measurement at high temperatures and under high pressures, as well as new flange sealing methods. Some smaller models of the pressure vessel are being tested in the same way to study the scalar effects.

#### *Universities in general*

Some attention may be given here to the general nuclear research work that is being carried out by the universities.

University nuclear physical research covers a large sector of the field of low-energy physics, such as radioactivity, radiochemistry as related to nuclear physics, reactions with particles charged up to approx. 60 mev, research with neutrons up to approx. 50 mev and nuclear reactions. Various accelerators, such as Van de Graaf generators and linear and circular accelerators, are in use or under construction. The latter kind includes the Delft clover-leaf cyclotron, which was developed for possible use as a reactor for the 1-gev proton synchrotron designed at the Delft Institute of Technology, but which, in itself, is an important and interesting development. In the field of high-energy physics work is going forward on the analysis of emulsions radiated in other countries and of bubble chamber photographs. A bubble chamber is under construction. Theoretical research in all these fields is also proceeding. Finally, chemical research includes the measurement by chemical methods of neutron fluxes at high and low energies and the measurement of low gamma intensities by means of counters as well as plutonium and radiation chemistry and tracer research of various kinds.

#### *Netherlands industry*

In the preceding section, and at various other points in this article, it has been stated that the Netherlands industry is called upon to participate in specific research and development projects. But Netherlands industry also does much work in the nuclear field on its own initiative and in connection with its own programmes. A well known firm of constructional engineers, for example, has designed the experimental plant for helium purification for the DRAGON<sup>1</sup>. The Netherlands electronics industry is going forward with the development of all kinds of plant and instrumentation for controlling reactors and for checking health.

As stated in the introduction, several large Netherlands firms are working together in a combination, the Neratoom Company, and are constructing the components and plant needed for the exploitation of nuclear energy.

The firms are as follows:

N.V. Machinefabriek 'Breda', late Backer & Rueb, of Breda (engineering works);  
Nederlandsche Dok- en Scheepsbouw Maatschappij of Amsterdam (shipyards);  
Philips Industries of Eindhoven;  
De Rotterdamsche Droogdok Maatschappij of Rotterdam (shipyards);  
Koninklijke Maatschappij 'De Schelde' N.V. of Flushing (engineering works);  
Koninklijke Machinefabriek Gebr. Stork & Co. N.V. of Hengelo (engineering works);  
Werkspoor N.V. of Amsterdam (engineering works);  
N.V. Dok- en Werfmaatschappij Wilton Feyenoord of Schiedam (shipyards);  
Comprim N.V. of Amsterdam.

Last year the Euratom Commission invited the Neratoom Company to submit a design for

<sup>1</sup>See later in this article.

critical experiment with heavy water that would accurately represent organic cooling. This experimental unit – the ECO reactor – is destined for the Euratom Centre at Ispra and makes possible a thorough study not only of the organically cooled ORGEL reactor but of all heavy-water reactors, irrespective of the cooling system used.

Together with American experts of the General Electric Company of San José (U.S.A.), a group of representatives of Netherlands electricity companies has made a preliminary design for a nuclear power station that operates with boiling water. This station, which will largely be constructed in the Netherlands, will have a capacity of approx. 50,000 KW. For this project, which will probably cost 95 million guilders in all, Euratom has contributed a sum of 18 million guilders.

#### *International co-operation*

International co-operation in the peaceful use of nuclear energy is essential for a country like the Netherlands, which does not itself possess the raw materials and the knowledge necessary for carrying out its national programme independently.

In addition to the agreement with the Norwegian 'Institutt for Atom Energi', the Netherlands Reactor Centre has made an agreement with the United Kingdom Atomic Energy Authority under the programme for suspension reactor development, regarding exchange of knowledge and visits and the supply of materials.

The Netherlands Government and the United States Government have, moreover, concluded an agreement concerning the purchase or lease by the Netherlands of a maximum net quantity of 500 kg U-235 from the United States. Part of this quantity may be supplied with an enrichment of 90 per cent. Furthermore, the United States had promised to allocate \$ 350,000 towards the purchase cost of the High Flux Reactor. This sum has meanwhile been handed to the Netherlands Government.

Besides being a member of the European Atomic Energy Community (Euratom), the Netherlands takes part in the activities of the European Nuclear Energy Agency (ENEA) of the OECD in Paris, the International Atomic Energy Agency (IAEA) in Vienna and the 'Organisation Européenne pour la Recherche Nucléaire' (CERN) in Geneva.

Through Euratom the Netherlands is concerned in the construction of a high-temperature gas-cooled reactor – the DRAGON project – at Winfrith Heath in England and in a research and experimental programme with the Halden boiling-water reactor in Norway. Both projects are being carried out under the auspices of ENEA in Paris. Again, within the framework of this organization, the Netherlands is directly participating in the construction of a factory for the reprocessing of fissionable materials for the 'Europese Maatschappij voor de Chemische Bewerking van Bestraalde Reactor brandstoffen' European Company for the Chemical Processing of Irradiated Fuels (Eurochemic) at Mol, Belgium.

An attempt has been made in these pages to give some idea of what is being done in this country, both on the national and the international plane, to develop nuclear energy for peaceful uses.

Naturally, the Netherlands is not as far advanced as the great powers, who, partly through their military efforts, have acquired so much more experience. Nevertheless, both the scientists and the industrial concerns of the Netherlands have established a fine record of achievement in the field of nuclear energy.



# 'Nederlands Atoomforum' Nuclear Energy Association

'Nederlands Atoomforum' Nuclear Energy Association was founded on 28th February 1961 on the initiative of a few Dutch concerns and of the Netherlands Reactor Centre. The secretariat is accommodated in the offices of the Netherlands Reactor Centre, 112, Scheveningseweg, The Hague.

The aim of the 'Nederlands Atoomforum' is to foster the generation and use of nuclear energy. It endeavours to achieve its aim by:

- setting up, with or without the co-operation of existing organizations at home and abroad, a centre of documentation and information on the generation and use of nuclear energy in the widest sense;
- making developments in this sphere widely known, particularly the activities of Dutch industry in the field of nuclear energy and of the Dutch institutions concerned with it, by issuing publications on those developments and activities and by arranging for and organizing conferences, lectures, exhibitions and other similar demonstrations;
- by fostering the use, when necessary or desirable, of industrial products of nuclear origin such as radioactive isotopes, in industry, agriculture, medicine etc., and by providing information on them.

Ordinary membership is open to Dutch legal persons (including partnerships and limited partnerships); special membership gives natural persons of Dutch nationality an opportunity to support the association's aims.

On 30th June 1963 the association had 30 ordinary members and 7 special members; two of the ordinary members (N.V. Neratoom and 'Reactor Centrum Nederland') represent a number of Dutch concerns.

The association has already arranged ten lectures in various towns, on the various uses of nuclear energy, including the propulsion of ships; the uses of radio isotopes in engineering; the economic, juridical and insurance aspects; international co-operation and new techniques. In addition an exhibition showing the uses of radioisotopes in engineering, in which thirteen Dutch concerns took part, was held in Delft.

'Nederlands Atoomforum' represents the Netherlands in 'Forum Atomique Européen' (FORATUM), the international union of European National Nuclear Forums.

Furthermore, the association maintains regular contact with the international organizations in the field of nuclear energy by sending them documentation from its members, and in other ways.

# The Foreign Trade of the Netherlands

Foreign trade in every country has its own individual and separate existence with its own pattern of labour distribution and specialization. In every country it plays a more or less important role in the attainment of prosperity. This is particularly applicable to the Netherlands. Its economy is so closely interwoven with that of the rest of the world that a very large proportion of the goods which are manufactured and traded cross its frontiers. Thus foreign trade can be described as a decisive factor in economic development. To illustrate this we give the following facts:

Visible foreign trade, expressed as a percentage of the gross national product, amounts to about 75%.

About 30% of national income depends directly upon the export of goods and services.

What Dutch industry sells abroad constitutes about one-third of total sales.

## The Development

The part played by foreign trade in the Dutch economy since the war has increased in importance. It is not only the growth in the population and greater prosperity that lead to bigger imports of raw materials, but also the imports of capital goods and end products. On the other hand, we have the growth of Dutch exports, 70% of which consist of industrial end products and 30% processed and unprocessed farm produce. The following index figures for the volume of foreign trade give an idea of this development:

TABLE I  
Volume Index Figures for Foreign Trade (1953 = 100)

	Imports	Exports
1949	74	53
1955	135	125
1959	169	165
1960	198	188
1961	215	195

Taking the long-term view, exports rose more strongly than imports, so that the overall percentage of imports in relation to exports was raised from less than 70% before the war to over 80% after it. The importance of visible exports for the balance of payments tends to become greater. However, receipts from services, such as transport, trade, tourism, etc., continued to be of essential importance for the equilibrium of the balance of payments, as the following table shows:



TABLE II  
Current Account of the Balance of Payments (in thousand millions of guilders)

	Credit			Debit		
	1949	1955	1961	1949	1955	1961
Visible imports and exports	3.7	9.9	15.3	4.7	10.5	16.6
Services	1.2	2.9	3.5	0.6	1.6	2.1
Capital receipts	0.4	0.7	1.5	0.2	0.4	0.9
Total	5.3	13.5	20.3	5.5	12.5	19.6

### Composition of Imports and Exports

It is obvious that, in view of the economic structure of the Netherlands, imports of raw materials and semi-finished products make up a considerable share of total imports. This is about one-third. Imports of industrial end products, investment goods and consumer goods are, however, higher at between 30 and 40%. Imports of agricultural produce (including foodstuffs) amount to slightly less than one-fifth of total imports, while coal and oil together make up almost 15% of total imports.

For the last 20 years the Netherlands has been obtaining some of its electric power from abroad. The high proportion of imports to exports is, however, largely due to the fact that the Netherlands is a petroleum refining centre. This is also apparent from the large share (10%) of petroleum products in total Dutch exports. For that matter, exports consist mainly of industrial products, in consequence of the vigorous expansion of industry since the Second World War. Dutch industry is responsible for nearly 70% of exports, the rest being made up of agricultural produce and foodstuffs.

The end products of the metal industry (including the electrical industry) constitute the largest contribution to industrial exports, comprising 20% of total exports. The share of other branches of industry in total exports is as follows: textile industry 8%, chemical industry 8%, iron, steel and non-ferrous metals 6%.

### The Expansion of Dutch Trade

Trade relations with the highly industrialised countries of Europe have always been of great importance for the Netherlands. Before the war 40% of Holland's imports came from Germany, the United Kingdom and Belgium, and nearly 50% of her exports went to those same countries. Much of her non-European trade was with the former Netherlands Indies, and the United States was one of the most important suppliers. Increasing European co-operation greatly stimulated trade relations in Western Europe after the war. Benelux co-operation further increased the share of the Belgium-Luxemburg Economic Union in Dutch imports and exports, the

liberalization of trade under the O.E.E.C., and the reduction of tariffs introduced under the E.E.C. were a factor in the growing share of other E.E.C. countries in Dutch foreign trade. In 1961 the share of these E.E.C. countries in Dutch imports was nearly 50% and in exports nearly 48%. The share of the United Kingdom, on the other hand, declined. It amounted in 1961 to 7% for imports and 10% for exports, as against 8% and 20% respectively in 1938.

Troubled relations with Indonesia practically reduced trade to zero. Compensation for this was found to a certain extent in an expansion of trade with other Asian territories and with Africa. The share of these territories in Dutch exports now amounts respectively to 7% (3% in 1938) and 5% (3.8% in 1938). The figures for imports are respectively 10% and 4.4% (13% and 1% in 1938).

Meanwhile, Holland is doing more business with industrialised countries than with countries supplying raw materials. This is logical, since imports of raw materials and foodstuffs do not rise in the same extent as national production, which is highest in industrial areas. So the percentage of Dutch imports coming from the United States, which has been fairly constant in recent years, is greater than that of other non-European countries.

TABLE III  
Dutch Imports and Exports per Country in %

	Imports					Exports				
	1958	1959	1960	1961	Jan./Aug. 1962	1958	1959	1960	1961	Jan./Aug. 1962
Europe	60.1	63.8	64.3	68.0	67.3	71.6	72.6	74.4	75.5	77.1
of which E.E.C.	42.0	44.4	45.8	49.2	49.4	41.5	44.3	45.9	47.6	49.1
Belgium	17.9	18.4	18.3	19.0	19.3	15.0	14.7	14.3	15.1	14.7
W. Germany	19.5	20.7	21.6	23.1	22.7	19.0	21.6	22.5	23.1	4.3
France	2.8	3.6	3.8	4.6	4.7	4.9	5.4	5.9	6.2	6.5
Italy	1.8	1.8	2.1	2.4	2.7	2.7	2.7	3.2	3.2	3.6
Other OEEC										
(OECD countries										
(excl. U.S.										
and Canada)	14.5	14.9	14.3	15.3	14.8	26.8	25.0	25.2	24.9	24.9
U.K.	7.4	7.6	6.9	7.2	7.1	11.9	10.7	10.9	10.0	10.5
Sweden	2.9	2.9	3.0	3.1	2.8	4.5	4.2	4.7	4.5	4.1
Switzerland	1.6	1.7	1.8	1.9	1.8	2.5	2.4	2.3	2.6	2.9
East Europe	2.1	2.8	2.1	2.0	1.8	1.6	1.6	1.6	1.8	1.8
Asia	14.1	11.7	11.2	10.0	9.2	7.2	7.4	7.3	7.0	6.2
of which										
Indonesia	2.2	2.1	1.4	0.8	0.4	0.9	0.7	0.6	0.3	0.1
Africa	4.9	4.5	4.4	4.4	4.7	5.9	5.3	5.3	4.9	4.8
North America	13.3	12.2	14.6	11.9	12.7	6.7	6.8	5.9	5.5	5.1
of which U.S.	11.3	10.4	13.2	11.1	12.0	5.6	5.7	4.9	4.4	4.4
Central America	1.6	1.5	1.1	0.9	5.8	2.9	2.0	1.8	2.0	4.5
South America	5.4	5.2	4.0	4.4	—	3.2	3.5	3.0	2.6	—
Pacific	0.5	0.4	0.4	0.4	0.4	1.2	1.4	1.3	1.2	0.9

1) Belgium-Luxemburg Economic Union.



## Transit and Third-Party Trade

Transit trade forms an important part of Dutch economic activities. Because of its favourable geographical position, the Netherlands has always played an important part in the supply of goods for Western European industry and the export of goods from this area. The 'good' influx is by far the biggest. It comprises mineral oils, ores, coal, scrap metal, grain, meat, tropical fruits, sugar, cocoa beans, coffee, tea, tobacco, spices, skins, oil-bearing seeds, timber, timber waste, rubber and textile fibres. The outgoing stream of goods consists mainly of coal, natural fertiliser, artificial fertilisers, chemical products, metals and machines.

Total transit goods amounted in 1960 to 60 million tons. About two-thirds of this amount was transhipped.

It is impossible to indicate exactly the significance of this activity for the Dutch economy. However, it can be said that Dutch businessmen secured a large share of those transactions requiring specialised knowledge or great experience. An example is trade in tropical products such as coffee, tea, tobacco, rubber and spices.

Some Dutch firms with foreign connections were concerned with the world production of and world trade in mineral oils, oil-bearing seeds for the margarine industry, and ores, all of which form the subject of transit deals.

In addition, some large Dutch firms with branches throughout the world were involved in the sale overseas of Western European industrial products, particularly heavy machinery, factory plants, engines, etc., which have to be serviced over a number of years.

The Netherlands, a commercial country by tradition, occupies a leading position in tripartite trade, i.e. the purchase of goods abroad and their sale to third countries. Dutch businessmen are very expert in this field, particularly owing to their knowledge of tropical products, the markets for such products and the markets in the tropical countries themselves. Dutch firms have branches in all parts of the world and are able to make use of the services of Dutch banks.

The importance of Holland as a business centre is also reflected in the number of futures markets operated in the country.

Rotterdam has futures markets for maize, unrefined linseed oil, coffee, pepper and pulses, while Amsterdam has similar markets for cocoa, pepper, rubber, coffee, hides, copra and potatoes.

The futures markets for pulses and potatoes are chiefly for trade in Dutch produce.

On the other futures markets, goods of foreign origin are traded.

## Some Features of Agriculture

In the first chapter we made it clear that the Netherlands is protected by dunes and dikes against the sea. By means of ditches and canals, pumps and sluices, surplus water in the interior of the country is removed. Some branches of the delta formed by the large rivers Rhine, Maas and Scheldt, are directly connected with the sea, so that salt water penetrates into the land and threatens valuable arable land with salination. Moreover, in periods of heavy rainfall floods very easily occur. On the other hand, land in higher areas is threatened with drought, especially in dry periods. When completed the Delta project now being carried out will assist agriculture by averting the risk of salination and by making fresh water available in the surrounding sandy areas.

The preservation of a reasonable acreage of arable land in such a densely populated country, proper irrigation and a generally favourable climate are essential conditions for Dutch agriculture.

The climate of Holland is most suitable for pasture. The proportions of pasture, arable land and land for market gardening are roughly 13 : 9 : 1. Rainfall is about 750 millimetres and the average number of hours of sunshine is 1,585 per year.

Holland has 100 hectares of arable land available, on an average, for every 500 inhabitants. The equivalent figure for West Germany is 365, for Great Britain 415, for France 130 and for the United States 24.

The dense population and the shortage of arable land make intensive farming necessary. In addition, the increase in labour productivity which is required and the scarcity of arable land (2.3 million hectares in all) result in many farmers moving to other branches of industry. This movement can be further intensified by increasing industrialisation and by emigration.

In this country where land is scarce the Government has to take measures to prevent speculation in land and to provide reasonable protection against inflated prices for those leasing land. Moreover, these measures prevent any upward pressure on the prices of products, both in the interests of

TABLE I  
Averages 1953-1957

	Milk per cow in kg	Eggs per hen	Wheat kg/ha	Barley kg/ha	Potatoes, kg/ha	Sugar beet kg/ha
Netherlands	3,960	195	3,840	3,810	26,000	40,000
Denmark	3,630	228	3,900	3,600	18,800	36,100
W. Germany	3,010	125	2,900	2,700	22,200	35,000
France	2,100	110	2,300	2,300	15,000	30,200
U.K.	3,030	184	3,100	2,900	19,400	28,400
U.S.A.	2,650	199	1,290	1,530	18,210	37,020



the Dutch consumer and in the interests of the export position of agriculture and the food industry.

It might be thought that the reclamation of land from the sea would bring a certain easing of the demand for land. This is not the case, however, because of the rapid growth of the population which already totals 11.5 million and is expected to reach 13.4 million in 1981. Such a large proportion of the newly-won land has to be used for the expansion of cities, recreation areas, roads, etc., that the gain is practically offset by the loss.

The concentration of a large population in a small territory has led to intensive agriculture. The statistics in Table I show the large production capacity of the Netherlands.

Far-reaching specialisation is partly due to efforts to make use of every single hectare. Extreme examples of this are to be found in horticulture. For example, a family can derive quite a good income from a product such as lilacs on a tiny piece of ground of about half a hectare.

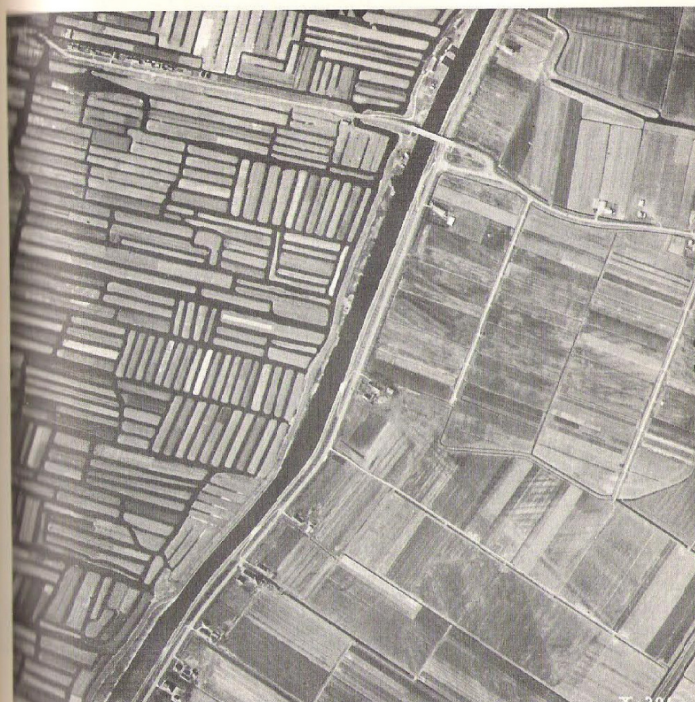
Efforts to extract the utmost from the ground are also reflected in the use of fertilisers.

TABLE II  
Consumption per year in kg per ha 1958-1959

	Nitrogen N	Phosphates $P_2O_5$	Potash $K_2O$
Netherlands	91	49	63
Denmark	34	36	55
Germany	40	45	71
U.K.	27	30	30
France	16	29	24

There are some 176,000 farms in Holland. Many of them (57,000) cover between 5 and 10 hectares and only 10,400 are larger than 30 hectares. The average Dutch farm is 11 hectares. The typical sort is a small family farm on sandy ground with mixed farming: i.e., such products as milk, pork and eggs form the main source of income, while the products of the land are mostly used for the animals. There are no hired labourers on the small family farm. The farmer runs the farm, assisted by his wife (who usually looks after the young animals) and by his children. In more recent years, particularly, efforts have been made to increase labour productivity on the smaller farms by providing information on organization and mechanization which results in a reduced need for labour. This is accompanied by a programme directed towards improving the 'infrastructure' (production factors outside the control of the farm which nevertheless influence productivity). This programme aims at the modern style of re-parcelling land. Not only are scattered pieces of land joined together and their shape improved, the usable area enlarged where possible, irrigation made more efficient and country roads laid, but attention is also given to slum clearance, bringing public utilities to the farms and preserving the countryside.

In carrying out this programme it is often necessary to develop farming techniques by means of a special information programme. At the same time, farming organizations can stimulate the



Re-allocation of land is transforming Holland's landscape. Before and after re-allocation.



mental and cultural adaptation of the people to the new way of life. Domestic information is also given, to stimulate productivity in the farm household. These problems are therefore tackled regionally in an organized way. Altogether more than 50 regional improvement programmes are being carried out.

There is great interest in the re-parcelling of land. Applications for re-parcelling now cover more than 1.2 million hectares. However, the annual capacity is between 3 000 and 4,000 hectares. In 1960 some 240,000 hectares were being re-parcelled and 130,000 hectares had been completed. In addition, special projects for water control, opening-up of the land and improvement of the soil are being carried out. In recent years the Government has made available about 180 million guilders annually in subsidies and loans for all these projects.

The farming population, which, according to the last census in 1947, made up more than 19% of the Dutch working population, now amounts to an estimated 13%. There are about 130,000 farm workers and market gardeners in the Netherlands, of whom about 94,000 have their own organizations. There are collective labour agreements for farm labour. The total number of organized farmers (as distinct from farm workers) is 168,000.

The proportion of owned property to leased property in 1950 was 44 : 56. In 1959 the ownership percentage was 47.6.

Livestock farming is the main branch of agriculture. The livestock population amounts to about 3.4 million head, or 117 milk-cows per 100 hectares of pasture. The total annual milk production is 6.4 thousand million litres, with an average fat percentage of 3.75. About 60% of this is used for domestic consumption and 40% is processed for export. In 1959 production per cow amounted to 4,152 litres.

As at May 1959 other livestock consisted of: 196,100 horses, 2,500,000 pigs, 522,000 sheep (Texel breed), 43 million chickens and 980,000 ducks. (In 1959 the egg production figure per hen was 204.)

Every attention is given to the health of livestock. All are free of tuberculosis; every effort is being made to eliminate contagious abortion (abortus Bang). All cattle are inoculated each year against foot and mouth disease. There is, moreover, an organized campaign against the warble fly.

In 1959, 53% of Dutch cattle farmers were members of the Artificial Insemination Association; the number of inseminated cows then amounted to 1,110,000. In that year 66.5% of cows in milk and in calf were checked by the appropriate milk recording associations. About 30% of all cattle in the Netherlands are registered in the two major herd books: the Netherlands and Friesian Herd Books.

There are three varieties of cattle in the Netherlands: 78% are of the black-and-white Friesian breed, 19% of the red-and-white Meuse-Rhine-IJssel breed and 3% of the Groningen 'Blaarkop' breed. At the end of 1960 mechanical milking was employed on about 40,000 farms.

The rapid development of motor traction on Dutch farms appears from the following table:

TABLE III

Number of Tractors		Number of Horses	
1950	21,000	1950	256,000
1958	57,000	1958	200,000
1960	70,000	1960	196,000



*Dutch black-and-white cattle at pasture.*



The products from cattle farming, arable farming and horticulture include:

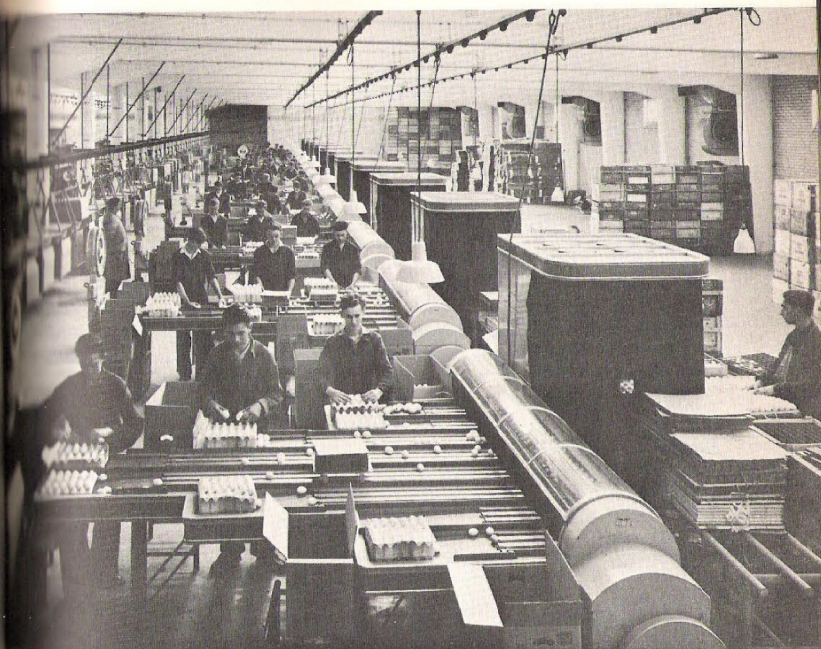
	<i>Yearly averages 1956-1959</i>
Meat	650,000 tons
Eggs	271,000 tons (17,000 per ton)
Butter	81,000 tons
Cheese	172,000 tons
Condensed Milk	300,000 tons
Milk powder	69,000 tons
Wool	1,000 tons
Wheat	840,000 tons
Fodder grain	840,000 tons
Potatoes	3,608,000 tons
Beets	3,047,000 tons
Raw sugar ex beet	452,000 tons
Pulses	109,000 tons
Oil-bearing seeds	37,750 tons
of which vegetable oils	8,500 tons
Flax	114,000 tons
Fruit	600,000 tons
Vegetables	1,100,000 tons

Holland is a major importer of some products: bread and fodder grain, raw materials for the fat and oil industries, products extensively grown in countries with large areas of farmland.

However, Holland is a major exporter of many other products: dairy produce, eggs, various forms of meat, bacon, fruit, vegetables, main crop and seed potatoes, potato flour products, bulbs, flowers etc.: all products which Holland produces by refining and specialisation and which free one-third of production for export.

Dutch agriculture bears the stamp of processing throughout: the importation of relatively cheap raw materials and the exportation of valuable animal products and the produce of an industry based on agriculture. The foundations of this development were laid at the end of the last century during the agricultural crisis in Europe, when Europe was flooded with cheap grain from new areas including America, the Argentine and Russia. Whereas other countries started to protect their agriculture at the frontier, Dutch agriculture concentrated on the production of processed products by using this grain. And these products were sold in the industrial areas of neighbouring countries.

Not only was the importation of agricultural raw materials as fodder completely paid for from the returns of agricultural exports, but considerable profit accrued to the Dutch balance of payments.



*Holland is the largest egg-exporting country in the world. A view of the grading department in the Roermond egg mart.*



## Reorganizing the Countryside

With the development of mechanized farming, the smaller plots of ground became unprofitable. By re-allocation of the land, the yield was raised to an adequate level. This was effected at first without difficulty. With the Government acting as arbitrator, land was exchanged and small plots were joined together to form larger units.

Re-parcelling of land as we know it today has grown from a simple exchange of land into a complete modification of the agricultural structure of a region.

In addition to a regrouping of the land, re-parcelling today also comprises an improvement in irrigation and water control, the opening-up of land, and, where necessary, the restoration of the profile of the soil. It also includes the removal and construction of farms, where necessary, as well as slum clearance, the laying-on of electricity and water, and rural development. The enlargement of smaller farms, where desirable and possible, is also an important aspect of re-parcelling. Whereas re-parcelling is a general plan for the improvement of the agricultural structure, it is not always possible or necessary to effect a total renewal. In many cases all that is needed is agricultural exploitation and modernisation of water-control.

In areas where the structural situation is reasonable a straightforward exchange of plots of land is in itself a big step towards improved productivity.

Each region requires, as it were, its own therapy. Organizational and budgetary factors very often make it essential to carry out the most necessary plans first, pending a later complete reconstruction.

In all provinces of the Netherlands we therefore see, in addition to re-parcelling, large-scale plans for water control and agricultural exploitation being carried out. Modern re-parcelling usually implies co-ordination of all local plans.

The labour situation in the country is also affected by the improvement in agricultural structure brought about by re-parcelling. The farmers in an area which has been rearranged in this way will in most cases be able to manage with less labour than hitherto. So there tends to be a surplus of farm labour. In the long run, therefore, re-parcelling supports regional industrialisation by freeing farm labour and in principle it is co-ordinated with regional industrialisation. This again affects planning: the reduction in the number of farm workers and the spread of industry leads to a wider distribution of the population throughout the country itself and to concentration in certain centres. In rural areas this phenomenon is called 'scale enlargement' and, when accompanied by re-parcelling, it also improves the standard of living in such areas.

The 'landscape' plan, which is part of every re-parcelling process, also tends in this direction. The new land is made as attractive as possible from the point of view of landscape. Certain areas are permanently protected from desecration. The countryside, being made more accessible, becomes a better recreation area for townspeople.

However, though the considerations leading up to re-parcelling are mainly human ones, it is also realised that if investments for the improvement of production potential are to be fully effective the farmer will have to learn to adapt himself personally and technically to radical changes.

For this reason it is very important that intensive instruction should be given both from the technical and the social and domestic points of view. This is done before, during and after the execution of the re-parcelling plan. Such instruction naturally has to be adapted to suit the local population. Re-parcelling is therefore always part of a wider coordinated programme in which the Ministries of Agriculture and Fisheries, Social Welfare, Housing (Planning and Slum Clearance), Social Affairs (Employment), Economic Affairs (Industrialisation) and Education, Arts and Sciences (Recreation) co-operate with certain organizations and with the population.

### Why Reconstruction?

If the farmer is to produce more cheaply, he must save labour by organizing his farm as efficiently as possible and by mechanization. Industry has been applying this principle for many years now. However, the farmers are not always able to mechanize and reorganize, however much they might like to do so. There are many factors which they cannot control, such as the re-parcelling of land, the opening-up of areas, water control and the actual location of the farm. These circumstances are known as 'the external production factors'. Only the execution of a well prepared reconstruction plan can be of use here.

In the case of re-parcelling, therefore, it is actually a question of investing in fixed means of production which are necessary to achieve greater efficiency and justified mechanization.

But there is another reason why re-parcelling is so important. In many agricultural areas, which have been such for centuries, only a limited number of products can be produced. This makes the economic basis of the farms concerned more narrow and very vulnerable. By better drainage and by making areas more accessible, as well as by improving the soil profile, a greater choice of crops is often possible, so that the farm can adapt itself more easily to changing demand.

Re-parcelling is therefore partly justified on economic grounds. There are, however, other arguments. The most important consideration is the basis for the prosperity of the farmers and the rural population as a whole.

The re-parcelling of land is not only an economic affair; it also affects social policy, national security and the social, mental and demographic development of the land. In other words, rural reform is necessary both for the promotion of farm production and for the improvement of the country as a home for people, in both material and spiritual respects.

### Re-parcelling Procedure

The re-parcelling of land follows the procedure laid down in the Re-parcelling Act. Re-parcelling, either in terms of number or area, is carried out after the approval of the majority of landowners has been obtained. However, before this stage is reached, a great deal of work has to be done. Before a given area can emerge completely reorganized three phases have to be passed through. The first phase only begins after at least one-fifth of the owners in the area have applied for re-parcelling either through an agricultural organization, a municipality or a water board and after the Central Technical Committee has decided to make the necessary preparations. These phases are: preparation, execution and subsequent care.

The preparatory period usually lasts five years. In this period there is a preliminary investigation.



The area is investigated with respect to its agrarian, surveying, soil, socio-economic and cultivation condition and is mapped for this purpose.

The various problems affecting development then emerge and can be listed. Such an extensive preliminary preparation must of course precede the actual drafting of the plan.

Often investments in land and buildings reach the order of f 3,000 per hectare or about f 30 million per 10,000 hectares. Usually, various plans are drawn up and the assets and liabilities compared. The plan which affords the greatest assets and the lowest liabilities is then worked out.

In the period of preparation farms are bought up by a special foundation on a voluntary basis. The land thus made available can be used later on during re-parcelling if necessary to enlarge farms which are too small. Such purchases of land are possible either when a number of suitable farmers can acquire a farm in the new IJsselmeer polders or when another farm becomes available. This is always possible when there is no one to succeed the farmer or when the farmer decides to take an industrial job or to emigrate. Finally, social instruction on the land plays an important part during the preparatory period. The whole area is on the move. The chief aim is that the population should become aware of changes in employment, housing and the running of farms, so that the required adaptation can take place.

The re-parcelling plan is prepared by a special committee consisting of leading farmers in a given area assisted by experts. These experts include such people as a technical adviser on cultivation, a surveyor, etc. The plan thus becomes to a large extent the plan of the farmers concerned. After a vote has been taken there is a period of preparation which may last from five to eight years. This is the period in which draglines and bulldozers, depth ploughs and scrapers completely change the appearance of the land. The water system is revised and water made more accessible, plots of land are laid out, new farms are built and slums are cleared away. Meanwhile, the farmer must be able to continue sowing and harvesting and looking after his cattle. In this period, too, agricultural instruction becomes more intensive, in order to provide the farming population with the best methods and aids in the changed circumstances. Social instruction is also given and a special purchasing system is continued, if necessary, until the plan for the distribution of land has been drawn up.

All this is done under the supervision of the 'Local Committee', of which a number of farmers and, if necessary, farm workers from the area are members and to which are attached as advisers the expert on cultivation and the surveyor.

After the work has been completed and the new plots of land have been distributed among the farmers, it would not be right to leave the population to its own devices in the new circumstances. There follows therefore the phase of subsequent care, during which technical and social instruction remains necessary. Domestic instruction is also needed in an area where many new farms have been built and where all of them are connected to modern utilities.

#### Financing and Organization

The re-parcelling of land requires investments amounting, on average, to f 2,700 per hectare. For national economic reasons the Government contributes towards the work, and the contributions vary between 60% and 70%.

There is a separate arrangement for the building of farms: a fixed subsidy is given, depending on the size and type of the farm. If this amount is expressed in terms of a percentage it can be said that an average subsidy of between 30% and 40% is given for new farms.

The subsidies are determined, on the one hand, by the total costs of building and, on the other hand, by the amount that those concerned pay by virtue of the enhancement of value. This payment takes the form of re-parcelling interest on the land over a period of 30 years and consists of 2½% interest and 2½% redemption. The Government provides subsidies amounting to about 100 million guilders per year for this work.

By drafting a number of different re-parcelling plans for the same piece of land it is possible to select the plan giving the best relationship between assets and liabilities. In addition, costs can be lowered by mechanizing and planning the work. Where farms are moved, efforts are also made to keep down costs by rationalised, functional and standardised building.

It is clear that the farmers do not possess the means to carry out this very complicated work on their own. For this reason the Government is prepared to assist financially and organizationally.

The central body for the re-parcelling of land in the Netherlands is the 'Centrale Cultuurtechnische Commissie', in which farming delegates, the appropriate ministries and departments of the Ministry of Agriculture and Fisheries and members of scientific institutions are represented.

This 'Centrale Commissie' is assisted in its work by the 'Cultuurtechnische Dienst' with a directorate in Utrecht. This organization prepares and finances (or, as the case may be, subsidises) the plans. Many diverse interests have to be co-ordinated for this purpose. Development companies, such as the 'Nederlandse Heidemaatschappij' in Arnhem and the 'Grond- en Ontginningmaatschappij' 'Grontmij' in De Bilt are technically responsible. Because of the increasing mechanization of the work these companies act more and more frequently as engineering bureaux which not only work out the plans but also supervise their execution by contractors.

Re-parcelling plans are drawn up as much as possible for areas which form a geographical whole. In recent years plots of land of 10,000 hectares and more have been taken in hand. The renewal of such large stretches of land naturally requires rapidity of execution, since it is in the interests of agriculture that the transition period should be as short as possible.

#### Significance

Of the 2,300,000 hectares of arable land in Holland about 1,500,000 hectares are in need of re-parcelling. Only the first steps have been taken in renewing the land. Altogether about 130,000 hectares of land, scattered throughout the country, have been completed. The area now in hand, however, already amounts to some 240,000 hectares.

It is obvious that it is impossible to renew the whole of the land in the Netherlands in this way in the course of a few years, for reasons both of finance and organization. For this reason a long-term plan has been worked out. After dealing with re-parcelling, the plan goes on to indicate the extent to which investments for development (opening up arable land, water control, etc.) will be required.

According to modern ideas of re-parcelling it is possible to raise areas with an obsolete agrarian structure up to the general level of productivity and prosperity. Since the overall aim is to lower



cost prices in agriculture, what is really at stake is the place of Dutch agriculture in the national economy. However, it would not be right to allow farming areas to fall behind even further, both from economic and social considerations.

Since the Second World War particularly, there have been big changes in the production process in farming, both technically and economically, but this does not affect those areas where the structure has not been modernised and adapted.

Industry and other branches of economic life are modernising themselves in the most rapid manner possible. They are able to do this because of the ideal position of the Netherlands at one of the main gateways to Europe and because of growing supplies of skilled labour.

The structural adaptation of the centuries-old farming areas can only be achieved by the new type of re-parcelling based on the Re-parcelling of Land Act of 1954 in conjunction with improvements in the social climate. In addition to increased productivity, the elimination of 'invisible' unemployment and the development of social life on the land, better opportunities are arising for farming to follow the development of consumption and sales. The re-parcelling of land is bringing about a change in the mentality of the country populace. People are becoming increasingly aware of the possibilities of modern aids and methods. Activities are inspired to a greater extent by economics. This development, supported by social and domestic advice, represents an added impulse for the increase in the prosperity of the area.

These changes on the mental plane contain important guarantees for life in such areas, viewed from the standpoint of migration and the spread of industry.

## The Many Types of Farm Co-operatives

A special form of co-operation between farmers, the co-operative, has been developed to a considerable extent in the Netherlands. Like so many organizations it was born out of necessity. The serious agricultural crisis in about 1880 induced the Government to establish a commission. One of the measures recommended was the foundation of credit co-operatives. The first of these was set up in 1896. This has given the impetus to the formation of co-operatives in a number of other sectors of the agricultural industry, the result being that there is a great variety of them nowadays: farm credit co-operatives, co-operatives for the purchase of agricultural supplies, co-operatives for marketing farm products, co-operatives for the processing of farm products and co-operatives for carrying out agricultural services. Agricultural co-operation developed at such a speed in the Netherlands that it became necessary to establish a special chair at one of the universities in order to bring a scientific approach to bear on the various problems and see to the efficient training of officials.

### *Agricultural Loan Banks*

As already mentioned, the first credit co-operative was established in 1896, and was modelled on the German banks which were operated according to the Raiffeisen system. The term 'credit co-operatives' is not, however, used in the Netherlands. Instead they are called 'agricultural loan banks'. Membership was originally only open to farmers and market gardeners. This restriction was later abandoned, with the result that many agricultural loan banks are like rural banks.

Agricultural loan banks obtain their funds in the form of savings and deposits from the rural population. After an initial hesitation in the early years, the vast majority of the rural population have long been using these banks. As unlimited liability is bound up with the membership, the status of agricultural loan banks for all financial obligations is very good indeed. The principle of decentralisation is put into practice in these agricultural loan banks; their sphere of operation usually encompasses only one village. The average membership is approximately 275. This means that account can be taken of the strongly varying personal circumstances of the farmers. In order to obtain a loan, security is required in the form of a pledge or guarantee by two sponsors. The security is of special importance in the case of short-term credits for small amounts. The loan is given for productive purposes and is granted by the honorary committee, which is made up of farmers who are themselves members of the bank and whose liability is thus made up of farmers who are themselves members of the bank and whose liability is thus unlimited. The interest charged is low in most cases because the running costs of these banks are very small owing to their simple structure and organization, and, moreover, the aim is not profit. The margin between the interest payable on savings and chargeable on loans usually allows for the formation of reserves which reduce the members' liability.

The local agricultural loan banks have set up two central organizations which are situated in Utrecht and Eindhoven. They act as clearing houses for the local banks in order to keep a balance between supply and demand. In this way, it is possible for one bank's surplus to be put at



the disposal of another. Furthermore, the central organizations give advice in legal, organizational and administrative matters and also help in finding suitable investments for surpluses. The central organizations also supervise the agricultural loan banks. The share capital of the central organizations is held by the agricultural loan banks in proportion to their turnover. The importance of these agricultural loan banks is apparent from the fact that more than 40% of the total savings deposited in savings banks, including the Post Office Savings Bank, is held by the agricultural loan banks. Credits allowed by the agricultural loan banks exceed those made by the four largest general banks together.

As part of the deposits are on a long-term basis, the agricultural loan banks also give long-term credits not only to farmers but also to local co-operatives. The issue of loans to regional and national co-operatives on a long-term basis is in the hands of the central organizations and a separate bank has been established at The Hague for this purpose. Many of the local agricultural loan banks now look after other banking matters as well for their members and thus they are becoming more and more like general banks.

There are now more than 1,320 local agricultural loan banks with about 372,500 members. The total balance in hand is approximately 4,200 million guilders and the total out on loan 1,900 million guilders.

Two co-operative dairy banks should be mentioned separately. These are at Alkmaar in North Holland and at Leeuwarden, the capital of the province of Friesland. The members of these banks are local co-operative dairy factories.

#### *Co-operatives for the Purchase of Agricultural Supplies*

As the majority of farming enterprises are small and the nature of their operations is many-sided, the purchase of agricultural supplies is attended by special difficulties. The first cooperative buying association was formed by a group of farmers in the south-east of the Netherlands to handle the purchase of fertilisers. This resulted in an important saving and also allowed a better control to be kept on the quality of fertilisers.

The idea was encouraging and similar associations were formed in a number of other localities. Their structure was very simple and, in addition to fertilisers, they bought feedingstuffs, seeds and seed potatoes, insecticides, fuels, agricultural tools, implements and machinery. These co-operatives also advised farmers on how to use the seed and seed potatoes in the most effective way.

Recently the co-operatives have gone in for buying petroleum products because of the increasing mechanization of farming. The oil products are partly obtained through an international co-operative purchasing organization, the International Co-operative Petroleum Association in New York, which runs its own oil wells and refineries.

The development of a central organization for the joint purchase of farm supplies took place rather hesitatingly. A major impetus was, however, given to this step at the end of the last century when fertiliser dealers formed a trust. The reaction to this on the part of the co-operatives was the formation of a central purchasing organization which, in addition to fertilisers, also dealt with the purchase of feedingstuffs and other products. At a later date for reasons inherent in their outlook on life, a group of co-operatives founded several regional organizations which work in conjunction with each other in a federation.





More than half of the fertilisers and feedingstuffs is purchased through co-operatives. As the co-operatives can anticipate the farmers' requirements, they build up stocks in silos which are located at many points throughout the country. They also operate milling and mixing plants for feedingstuffs and concentrates.

The co-operatives have always aimed at fixing prices so that they are in the farmers' favour. By propaganda and advice they contribute to the development of scientific methods. Part of the advisory service is an experimental farm called Schothorst at Hoogland, which is run by the two central organizations. Here, scientific research is carried out on the effect of various feedingstuffs on cattle, pigs and poultry. Annually, some 30,000 farmers visit this 150-acre farm where experiments are also carried out on the equipment and design of storage accommodation, housing for livestock, and other farm buildings.

There are now about 1,160 local purchasing co-operatives with 140,000 members. The largest organization is the National Co-operative Purchasing and Marketing Society for Agriculture, the 'Centraal Bureau' at Rotterdam, to which over 400 co-operatives are affiliated. The annual turnover of the Centraal Bureau is about 430 million guilders. In addition, there are four Roman Catholic regional organizations which work together in a central organization, the C.I.V., at Rotterdam. Their combined annual turnover is more than 343 million guilders.

#### *Co-operatives for the marketing of farm products*

When it comes to the sale of their products, farmers and market gardeners are in a difficult position as such products have to be sold as soon as they are ready for market. This applies, for instance, to vegetables, fruit, milk, pigs and eggs. It is especially for these products that the marketing co-operatives are of such great importance. Market gardeners hold co-operative auction sales, the first of which was held in 1887. These auctions are held at marketing centres where the market gardeners bring their products to be sold to the traders. These auctions operate on a cash basis. The auction associations check the quality of the goods offered in the interests of the buyers. Apart from the auctions for vegetables and fruit, there are also auctions for cut flowers, pot plants and so on. Since 1918, there has been co-operation between the nearly 150 horticultural auction centres through the Central Bureau of Horticultural Auctions at The Hague. This bureau aims at improving the quality of produce and takes care of the collective advertising. The bureau has also carried out good work in promoting uniformity in the use of packing materials. This organization, at the same time, promotes certain horticultural interests in dealings with the Government.

To ensure a reasonable income the auction centres have introduced, with government consent, a system of minimum prices. Produce which does not come up to these prices is withdrawn from the market and set aside for cattle feed. The 150 auction centres have a membership of 60,000. Their annual turnover amounts to some 685 million guilders.

Since 1900, farmers have given much attention to poultry. Egg auctions have been set up to deal with sales, and the eggs are graded and sorted. These auction centres also advise the farmers on modern methods of poultry keeping and this can be considered to have contributed to the increase in production which now averages more than 200 eggs per bird per year.

The largest egg auction, at Roermond, sells more than one million eggs a day. About 40 % of the eggs for export are from the co-operatives. The number of egg auctions in the Netherlands is about 30 and they have 65,000 members.





As far as wool is concerned, there is only one co-operative for the whole country with 53,000 farmers as members.

A milk marketing co-operative was started in the west of the country where the milk is also exclusively used for domestic consumption. It operates some dairies and dairy factories.

As regards arable farming, there have long been co-operatives for seeds and seed potatoes. It is estimated that the co-operatives handle 40 % of the sales of seed potatoes and 30 % of the seed sales.

Another form of co-operative marketing is the dairy sales associations which have been set up by the co-operative dairy factories. There are seven dairy sales organizations, to which 70 % of the co-operative dairy factories are affiliated. Together, they sell about three-fifths of the total butter production, more than two-fifths of the total cheese production and one-third of the total milk powder production of the Netherlands.

Finally, there is also a central sales co-operative in the potato starch industry, the Co-operative Marketing and Production Association for Starch and Derivates 'Avebe', located at Veendam. Twelve of the 15 co-operative potato starch factories are associated with it.

#### *Co-operatives for the Processing of Farm Produce*

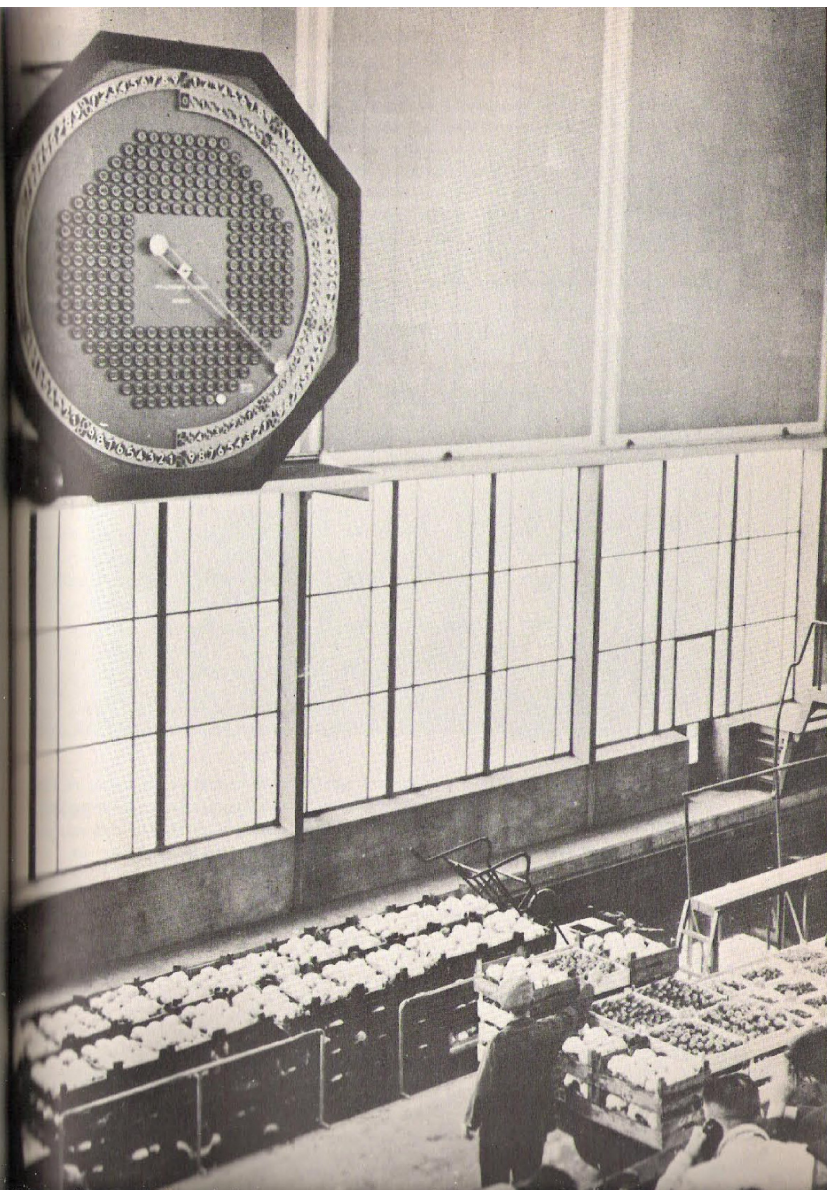
Until the 1880's, milk was processed into dairy products on the farms. As techniques improved dairy factories were started, and they purchased the milk from the farmers and processed it for their own account and at their own risk. But as the private dairy industry lacked sufficient factories the farmers themselves set up co-operative factories which were founded almost simultaneously at various places. There are now 340 of these factories in the Netherlands. They process more than 70 % of the milk delivered to dairy factories and dairies. The net profits are distributed to the members of the co-operatives according to the quantity and fat content of the milk delivered.

In addition to the potatoes grown for direct consumption in the Netherlands, considerable quantities are used for processing into potato starch which is the raw material for many products. In this field, too, a number of co-operatives have been set up since 1897. At present they process about 83 % of the potato starch production. In this connection it should be noted that private industry has concentrated much more on processing potato starch into other products.

In 1899, the first strawboard mill on a co-operative basis was founded. Farmers taking part in a co-operative were obliged to take up one or more shares of f 1,000 and also a fixed amount of straw. Ten out of the 19 strawboard mills are co-operatives and they account for 65 % of the turnover. The strawboard, chiefly used as packing material, is almost entirely marketed in England. There is considerable co-operation nowadays between the private and the co-operative industries.

In 1899, the first beet sugar mill on a co-operative basis was established. Its financing was on a share basis and also included a delivery obligation. There are now six co-operative beet sugar mills as well as six private mills, the latter being under the control of one parent company. Between them, the co-operatives process 63 % of the sugar beet.

There has been a co-operative flax processing plant since 1920. It is the only large undertaking in this field in the Netherlands.





Pig farming is of considerable importance for farmers in the Netherlands. The chief products are ham, bacon and tinned goods. Part of the total output of these three items is exported. Between 1914 and 1940 a number of co-operative slaughterhouses were started. Because of co-ordination in private industry, the co-operatives set up two central organizations. The co-operative slaughterhouses process half of the bacon, which is nearly all exported to England.

A factory for the manufacture of superphosphates should also be included in any reference to the processing co-operatives. This came into being as a result of a reaction on the part of farmers to the amalgamation of private factories making this fertiliser. The co-operative factory is located at Vlaardingen in South Holland and is a large plant, supplying about a third of the Netherlands production. It has a subsidiary in South Africa to deal with exports. This is necessary because there is only a demand for this product in the Netherlands for part of the year and the superphosphates cannot be stored for long periods.

#### *Co-operatives for Farm Services*

Co-operatives have also started doing work for the farmers. A large number of associations operate seed potato stores and grass driers. The co-operatives for the use of farm machinery are of great importance. Many of these co-operatives have been established since 1945. This development was strongly stimulated by the fact that their management results in a lower cost of production. The co-operatives for artificial insemination own one or more bulls. Through the use of good breeding stock, these regional co-operatives contribute to the improvement of national livestock. A number of farmers' unions operate co-operative agricultural accountancy bureaux which look after the clerical work for their members and help in financial matters. The work of these bureaux is also significant because it fosters farm economy and supplies information on profitable methods of operation. In addition, mention should be made of the mutual insurance companies. These cover business losses, life insurance, third-party liability and employers' risks in connection with social insurance.

#### *National Co-operative Council*

In 1934 the National Co-operative Council was set up by the central organizations of the agricultural purchasing and marketing associations, the service co-operatives and the agricultural credit banks. All central organizations are eligible for membership. The Council watches over the interests of its members, its representative and publicity duties being paramount.



*Making cheese in a co-operative dairy factory.*



## The Fishing Industry

Fishing occupies a special place in the thoughts of the Dutch nation. The reason is that fishing is a natural occupation in Holland because of its many rivers, inland seas and the North Sea on its west coast.

In the 16th and 17th centuries fishing played a great part in national life and helped to lay the foundations for the prosperity of the country. The processing and sale of the products of the fishing industry resulted in the rise of an extensive trade. The knowledge and experience gained of the sea and its ways during fishing expeditions made voyages of exploration possible to all parts of the world and thus greatly extended trade.

A simple invention made possible the growth of fishing in the 16th and 17th centuries. This was the gutting process, whereby the herring is cleaned of its lower jaw and internal organs, which are subject to rapid deterioration. This gutting process made it possible to preserve the herring catch more efficiently than could be done by simply salting it. As it could be kept longer, it could be transported over long distances. The simple fisherman, Willem Beukelszoon van Biervliet – the inventor of gutting – can be claimed to be the founder of the Dutch international herring trade. His method of conservation is still used today.

Some idea of the liveliness of the fishing tradition may be gained from the festivities which take place every year along the Dutch coast in May, when the herring fleet sets sail. On this occasion 'vlaggetjesdag' (literally 'day of little flags'), the herring trawlers sail past, gaily decorated. It is also apparent from the interest shown in herring sold in the street and eaten on the spot. Rich and poor, old and young, men and women are to be seen round the mobile herring stall, the 'haringkarretje', busily discussing the quality of the fish and other everyday topics.

Another proof of this tradition is that many fisherfolk still wear the traditional costumes for which Holland is so famous.

The economic significance of fishing in Holland is not relatively very great. It contributes towards the national income to the extent of about 0.3%. The fishing industry supplies the protein so necessary for the diet as well as the raw materials for industry and also acts as a training ground for the merchant navy.

### North Sea Fishing

Dutch fishing in the North Sea consists of three different kinds: trawling, drift-netting and seining.

To start with the traditional product par excellence, herring are caught with drift-nets, the fish swimming in large shoals close to the surface. This branch of fishing, for which motor and steam drifters are used, is not practised throughout the year but only from the middle of May to the middle of December, the breeding period. Each vessel is equipped with between 60 and 100 nets which together form the herring net. This net is suspended behind the ship like a curtain

several miles long. The meshes of the net are large enough to admit the head of a herring, but when the fish tries to get free the meshes close behind its gills. When the nets are hauled in, the herring are shaken loose on the deck, gutted immediately and packed in barrels. At the beginning of the season the herring fleet fishes off the Orkney Islands, moving southwards towards the Channel as the season progresses. Whoever gets home first with his herring can be sure of a high price. For that reason the shipowners use high-speed boats, known as carriers, which carry to the home port the catch from other ships of the same company or other companies with which they are co-operating.

Whereas herring drift net fishing is a seasonal occupation, trawling goes on all the year round.

This branch of fishing is practised by motor trawlers, motor cutters and other smaller ships. For trawl fishing a bag-shaped net is used which is dragged through the water. In contrast to drift net fishing, therefore, a powerful engine is essential here. The trawl net is dragged over the bed of the sea or at a given depth and catches everything in its path. An important aid in locating shoals of fish is the echo sounder. It is inevitable that very young fish which cannot be marketed are also caught, unless the meshes of the trawl are wide enough to allow them to escape. International agreement has been reached on the need for wide-meshed nets, in order to reduce or prevent over-fishing of the North Sea. The International Convention of 1946 signed in London prohibits the use of nets with a mesh of less than 80 millimetres and the landing of fish below a minimum size determined for each species. No measures have yet been taken to protect herring. Reduced catches may be an indication that they, too, have been overfished. The whole problem is at present being studied by the International Council for the Exploration of the Sea and a permanent committee of the International Fishing Convention of 1946. Depending on the power and the size of the ships concerned, fishing is carried out along the coast, in the North Sea or in the waters around Iceland. The coastal fishermen, who naturally cannot go far afield, bring home most of the fresh fish: mainly flat fish, such as plaice, sole, turbot and brill. The motor trawlers concentrate more on quantity: fresh herring, haddock and cod.

Sea fishing with seines originated in Denmark. A seine which has been cast at sea is gradually hauled in, so that a kind of basin is formed. Young fish are able to escape through the wide meshes. This method is used chiefly by inshore fishermen.

The leading fishing harbours are IJmuiden (fresh fish), Scheveningen (salt herring), Vlaardingen (salt herring), Den Helder and Oudeschild, Texel, (fresh fish landed by coastal fishermen).

### Other Forms Fishing

Of the other kinds of fishing the following deserve special mention: fishing on Lake IJssel formerly the Zuider Zee, which was enclosed in 1932 and thus separated from the North Sea and the Wadden Sea; fishing in the rivers of South Holland Province and Zeeland; fishing for migratory fish; fishing in inland waters. Lake IJssel well known for its eel and pike-perch. Most of the eel comes from the fishing harbours on the shores of this large lake. However, the progressive reclamation of Lake IJssel has made more urgent the re-deployment of fishermen either to the North Sea or to other branches of industry. Eel is also fished in the rivers of South Holland Province. The rivers of Zeeland are famous for their cultivation of mussels. Shrimp fishing is also carried out along the whole coast.



Fishing for migratory fish in the rivers is of little importance now, owing to the water pollution which is one of the consequences of the industrialisation of Western Europe.

Freshwater fishing is carried on for both commercial and recreational purposes. Commercial fishing (there are about 1,500 professional fishermen) is mainly for eel, pike-perch, pike, carp and tench, while angling for sport, which has more than 400,000 enthusiasts in Holland, is concerned chiefly with pike, carp, perch and roach.

With the exception of some trout breeding here and there, Holland undertakes no artificial breeding of freshwater fish for direct consumption. All the artificial breeding of freshwater fish is for the production of fry for the stocking of natural streams. Re-stocking is financed. The fish are sold to the responsible organizations at below cost price. The difference is made up from the annual contributions paid by all fishermen, both professional and anglers.

#### Whaling

For whaling, Holland has a 26,830-ton factory ship, the Willem Barentsz, which operates in the Antarctic with 12 catchers of between 400 and 700 tons. This form of fishing contributes towards fat supplies in Holland.

#### The Fishing Fleet

In all, the Dutch fishing fleet comprises about 2,500 vessels, more than 1,750 of which have some form of mechanical propulsion. These include 250 motor trawlers and drifters, 470 motor cutters and 1,000 other smaller motor vessels. The development of the fleet is characterized by a steady growth in the cutter fleet, the laying-up of steamships and the replacement of smaller motor drifters and trawlers by larger vessels of a capacity of more than 500 horsepower. It is estimated that the fleet is manned by between 9,000 and 10,000 crew members. In 1954 the Government met the credit requirements of the fleet by a guarantee of 17,500,000 guilders. A 10-year fleet plan envisages the construction of 40 drifters, 10 trawlers, 20 large cutters and 40 small ones and the replacement of about 100 shrimp boats.

#### Supplies

Supplies of fish fluctuate annually around the 280,000 tons level. Of this about 60,000 tons are usually salted herring, 45,000 tons fresh herring, 50,000 tons other ocean fish, 5,000 tons mussels, 10,000 tons freshwater fish, 4,000 tons shrimps and 2,000 tons oysters.

#### Sales

The distribution of the landed fish takes place via auctions in the fishing ports to wholesalers, the fish processing industry, exporters and retailers. The fishmonger has to be qualified and must



*Hilversum: the 'Quatre-Bras' block of flats. Architect: W. M. Dudok.*



possess the necessary credentials. Before he is recognised, certain conditions have to be fulfilled with respect to his professional ability, his solvency and his shop equipment.

About half of the total amount of fish landed is exported. The chief buyers of sprinkled and soured herring are Germany, Belgium and Luxemburg, the Mediterranean countries, Russia, Poland and North America. Germany, Belgium and Luxemburg are also big markets for bloaters. Fresh herring goes chiefly to Germany, Belgium and Luxemburg, the Balkans and Danube countries, while 80 % of Dutch mussels go to Belgium and France.

#### Consumption of Fish

Fish consumption in Holland amounted in 1947 to 15.7 kg per head per annum, the highest figure ever reached. Thereafter, consumption dropped to 12.7 kg in 1948, 9.6 kg in 1949 and 9.5 kg in 1950. Consumption has remained at this level ever since. The decline in consumption is due to the fact that supplies of other food stocks have improved. Consumption is now (converted into fresh weight): salt herring 1.9 kg, fresh herring 0.3 kg, fresh ocean fish 4.6 kg, shell fish 1.0 kg, freshwater fish 0.5 kg, conserved fish 1.1 kg. Before the war, fish consumption in Holland averaged between 8 kg and 9 kg per head per annum.

#### Fish Processing Industry

This branch of industry has boomed since the Second World War. There are 14 fish canning factories at present, processing about 21 million kg of fish products per annum, chiefly herring and mackerel. There are also a large number of firms engaged in preserving herrings and mussels. A considerable number of firms are engaged in smoking and steaming herrings, which are very popular both at home and abroad. Smoked eel has already been mentioned.

#### Organizations

The link between the Government and the fishing industry is the Ministry of Agriculture and Fisheries. The Fisheries' Directorate of the Ministry comprises a number of fishery inspection services, the Netherlands Herring Control Service and the Government Fisheries Research Institute in IJmuiden. This institute has a vessel at its disposal for the purposes of biological and fisheries research. In addition to these services, which are concerned with production, there are new public bodies, such as the Commodity Board for Fish Products, a market control organization which comprises all the 'vertical' industries. The industrial boards comprise the 'horizontal' bodies, representing firms with a similar function. One, the Fisheries Board, includes representatives of the shipowners, of those employed in the fishing industry and of the fishermen themselves.



*One-family houses at Ulthoorn. Architect: J. G. de Groot.*



## Housing in the Netherlands

### Housing Needs and Housing Production

In the period between the two World Wars, 42,500 houses, on an average, were built each year. At the time this was sufficient, and during the economic depression of the nineteen-thirties it was more than sufficient, to satisfy the demand.

Since 1957, between 80,000 and 90,000 houses have been completed each year. On comparing these figures with those for pre-war building, it will be seen that twice as many houses have been built annually since 1957 as in the years before the war. Nevertheless, in this country one still cannot speak of a normal housing situation in which supply and demand balance each other. One of the main reasons for the lack of balance is the continuing great shortage of houses.

Many dwellings were either damaged or completely destroyed in the last war, and building had virtually ceased at that time. These circumstances led to a serious shortage of houses, which became even more acute during the first few post-war years when building operations were slow in getting under way because of the scarcity of many building materials. It was necessary to concentrate building efforts on the repair and reconstruction of dwellings damaged or destroyed during the war years. The housing shortage reached its peak in 1949. In that year there was a shortage of over 300,000 houses.

From then on, it became possible to accelerate the building of houses and to reduce to some extent the gap between demand and supply.

It is estimated that on 31 December, 1961 there was a shortage of 70,000 houses. It is expected that the arrears will have been made up by about 1966, but that will not mean that it will be possible to allow building to slow down.

On the contrary, it will be necessary to maintain the present rate for many years to come. Judging by the increase in population during the post-war years, it can safely be said that 50,000 dwellings will be needed annually to provide for the increasing number of households wanting accommodation. After 1965, the number may even go up to 60,000 or 65,000. Besides these houses, some hundreds of thousands more will also have to be built to replace old and dilapidated dwellings and those pulled down when slums are cleared. Furthermore, provision will have to be made for a reasonable reserve of houses to allow for normal internal migration.

If the housing programme is to be completed, more than half the country's building resources will have to be devoted to building private dwellings. Consequently, activities in the building industry will have to be drastically restricted. There is such a great demand for all kinds of buildings at present that many building projects have had to be postponed.

All manner of expedients are being resorted to with a view to stepping up the building of houses so as to restore the balance between supply and demand with the least possible delay. Public authorities provide the assistance necessary for research into standardisation and rationalisation, and special facilities are given when dwellings are built by labour-saving methods. Such methods may consist in using prefabricated sections or in the efficient organization of the



*The Hague: Modern Flats in Sportlaan.*



work to be carried out. About ten per cent of the dwellings completed after the war were built by unconventional methods.

### Rents and Subsidies

Most private dwellings are built with financial aid from the Government. This is necessary because of the continuing discrepancy between the rents of pre-war houses, controlled by rent regulations, and those of new houses, which are based on the cost price. Subsidies enable the rent of a new house to be fixed at a much lower level than would be possible if it were calculated on the basis of the cost of building. At the present time, the cost price of a house is considerably higher than it was before 1940 because of the very much higher cost of labour and building materials.

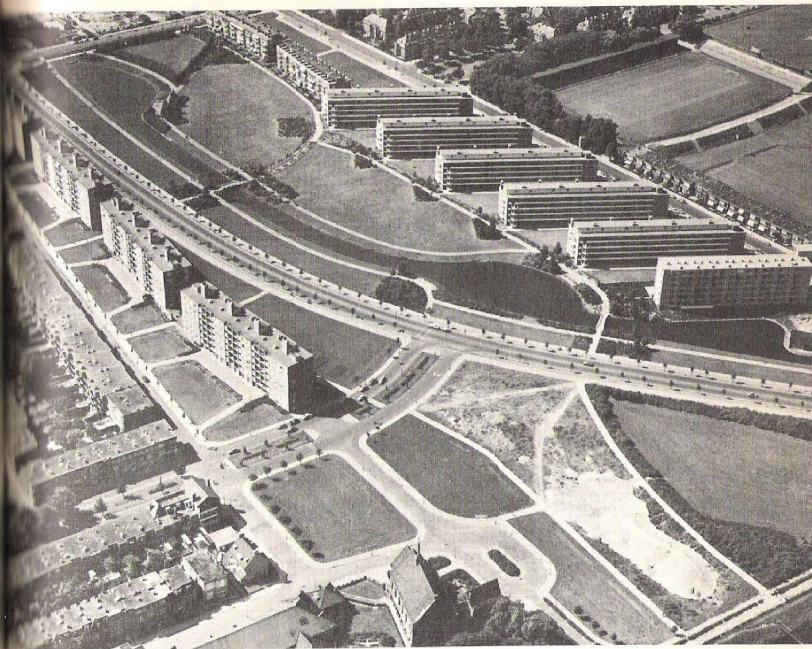
Rent control regulations have been in force since the beginning of the Second World War. In order to prevent unreasonable rent increases all rents were 'frozen' at the level of May, 1940, the month in which the Netherlands became involved in the war. Since then, rent control has formed part of the wage and price policy pursued by successive governments.

A rent increase of 15 per cent was permitted in 1951; it was the first modest step towards bringing all rents into line with the 'cost price' rents of new houses. There have been four more rent increases since then, and by 1960 the rent level for pre-war dwellings was brought up to an average of 222 per cent of the rent paid for dwellings in May, 1940. The rents of any post-war, pre-1960 dwellings that were below this level were raised and brought into line with the new rates. The rent for post-war dwellings built with government aid are fixed by the Minister of Housing and Building. This ensures that the subsidies are properly used.

Elimination of the remaining discrepancy between the level of rents for older houses and that of rents based on the cost price of houses now being built would call for a further increase in rents up to about 300 per cent (1940 = 100). Differences in quality between old and new houses have been taken into account.

Further adjustments of this kind, including rent increases for post-war dwellings, will make it possible gradually to reduce and eventually to discontinue government subsidies. Building will then become self-supporting again. However, it will have to remain possible for subsidies to be granted on social grounds, viz. to ensure that the low-income groups of the population are provided with adequate living accommodation at a moderate rent. Housing subsidies are granted by the Government to local authorities and building societies, and also to private persons or bodies. The houses built by local authorities and building societies are intended for the working-classes and other sections of the community in the same income group. The entire capital needed for the building of dwellings in this category is provided by the Government in the form of loans at four per cent interest, a lower rate than that usually charged on the capital market. The periods of such loans are fifty years when capital is lent for building costs and seventy-five years when it is lent for the purchase of land. In addition to these 'cheap' loans the Government provides an annual subsidy, thus enabling the rents to be fixed at lower levels than would be possible if they were assessed on the basis of the actual cost of houses, as stated above.

For owner-occupied private dwellings the subsidy takes the form of a grant paid as a lump sum followed by the payment of one supplementary amount. This arrangement has been made to



*Aerial photo of the modern residential quarter of Sportlaan-Segbroeklaan in The Hague.*



encourage the private ownership of houses. Subsidies are also provided for houses built by private enterprise and intended for letting. These subsidies take the form of a grant paid as a lump sum followed by an annual subsidy decreasing from year to year.

The present subsidy arrangements also provide for the subsidising of the building of homes or dwellings for old people, and special aid is given to encourage the demolition of slums.

Houses built with the aid of Government subsidies must not only satisfy normal building standards but they must also meet certain minimum requirements as regards fitness for habitation, such as the size of the rooms, cupboard and storage space, sanitary arrangements, equipment, etc. Such standards are laid down to ensure that houses built with subsidies will retain their value in the future.

Before 1960 only 5 per cent of the total number of houses built were completed without financial assistance from the Government. Since then, the number of private houses built without subsidy has risen considerably.

One of the main reasons for the change is that so many applications for grants are received that prospective builders have to wait too long for notification that a subsidy has been granted to them, and the subsidy carries a building permit with it.

Moreover, the difference between the cost of a subsidised house and one built without a subsidy was reduced by the lower scale of subsidies introduced in 1960 simultaneously with the rent increases.

935,729 new dwellings were completed in the period between the liberation and 1 January, 1967. 539,113 (57.6 per cent) of them were built for local authorities and building societies, 185,278 (41.2 per cent) for private persons or private institutions and 11,338 (1.2 per cent) for the Government and the provincial authorities.

Local authorities and building societies played a far greater role in building activities after 1945 than they did before the war. Most of the houses completed before the war were built by private enterprise. This was due to the following circumstances.

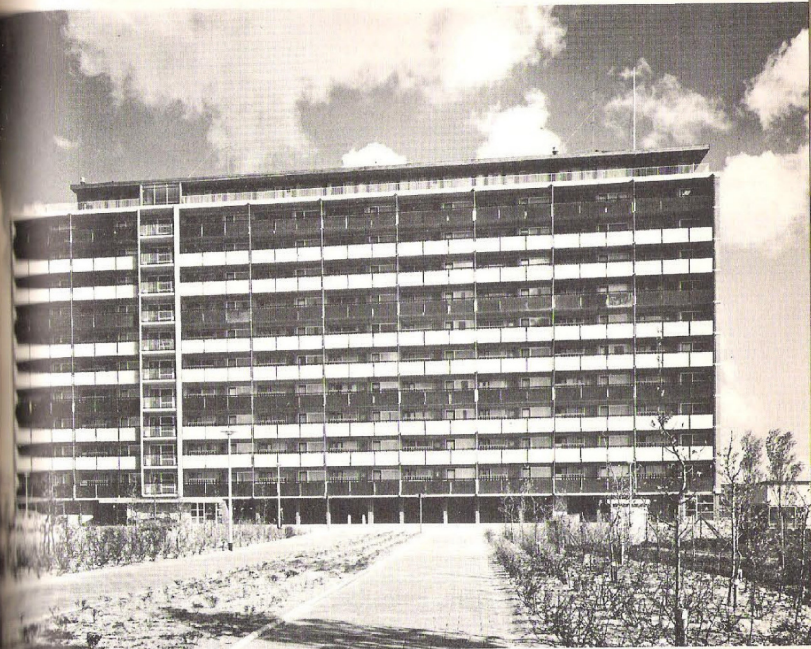
Subsidies were granted on a large scale to local authorities and building societies after the war so as to get building going again. Legislation was also introduced in 1947 to provide for subsidies for private builders. In spite of the opportunities to obtain subsidies, the number of private dwellings completed was relatively low at first. On the whole, investment in building did not appeal to private enterprise because of the rent control and the increased cost of building. Private building has increased to a considerable extent since then. Nevertheless, time and again, much of the housing programme has been devoted to building projects to be carried out by local authorities and building societies, i.e. for dwellings for the low-income groups of the population.

#### The Housing Act and the Reconstruction Act

It is under these two Acts that financial assistance is granted for housing projects.

The Housing Act regulates the financial aid to be given to local authorities and building societies and the Reconstruction Act makes provision for the granting of subsidies for private building.

The Housing Act was passed in 1901. It was the outcome of efforts that had been made to obtain legislation for the advancement and improvement of the country's housing.



*Pre-fabricated houses built in Schiedam by the 'Muwi' system.*



The most important provisions made in this Act were the following:

1. All local authorities were compelled to introduce building bye-laws and to set up competent services for their enforcement.
2. Local authorities were placed under the obligation and given authority to order that necessary housing improvements be carried out in their municipalities; they were obliged to make use of those powers and, if dwellings were beyond repair, to condemn them as unfit for habitation.
3. Municipal authorities and housing corporations were empowered to acquire the land they needed for communal housing projects by compulsory purchase and summary procedure.
4. The authorities of municipalities with more than 10,000 inhabitants were placed under the obligation to draw up plans for the extension of housing in their municipalities and to revise those plans every ten years.
5. It was made possible for financial assistance to be provided both by local authorities and by the Government for building undertaken to meet the needs of the community.

The Housing Act initiated the housing policy of the Netherlands and has formed the basis of the policy pursued in this country since 1901. It is still in force, but during the sixty years of its operation radical changes have been made to the provisions mentioned above under 4 concerning town and country planning. In short, the amendments made to these provisions have changed the plans drawn up for the expansion of building in municipalities to such an extent that they are no longer mere forecasts of the uncontrolled spreading of streets in urban districts but now take the form of plans for the development of the whole area of a municipality outside the built-up area; they can be effectuated because of the rights possessed by the authorities to issue or refuse building licences and to expropriate land.

A new Housing Bill has now been submitted to Parliament. In substance, its provisions are correlative to those of the Act of 1901, but in many instances they have been adapted to meet modern requirements and present-day conceptions. So far, town and country planning has been regulated to some extent by the Housing Act and, since 1950, also by a provisional act, the National Plan and Regional Planning Act. In future, there will be a separate Town and Country Planning Act. The changes in town and country planning policy embodied in the new Act will be of a radical nature and can best be described as constituting a rapid evolution.

The Reconstruction Act became operative in 1950. In addition to providing opportunities for granting financial assistance to private builders, the Act contains provisions for the elaboration of a regulation already introduced at the beginning of the Second World War to prohibit building without prior government approval. This regulation has been enforced ever since. It was necessary to do so because the total building capacity of the country is not sufficient to satisfy in a reasonably short time the great demand for new building that is largely due to the continued housing shortage and the expansion of industry.

Consequent upon the revision of the Housing Act, the provisions of the Reconstruction Act

covering government assistance for private building will cease to be valid. New provisions to cover this will be included in the Housing Act.

### Some Facts about Housing

In the tables below some figures are given for the period from the beginning of 1954 to the end of 1961 covering:

1. the types of dwellings built with the aid of subsidies granted under the Housing Act or under one of the arrangements made to provide grants for private building (one-family houses and dwellings in houses with accommodation for more than one household);
2. the average amount of living space;
3. the number of rooms.

*N.B.* The figures in Tables I and II apply only to dwellings for which a subsidy was granted in the period stated. No figures are available concerning the number of dwellings built without subsidies; this is a sector that has formed an important share of the total amount of building since 1961. The figures in Table III apply to all the dwellings completed, including those built without subsidies.

TABLE I

*Dwellings built under the Housing Act and those built with the aid of subsidies, listed according to whether they are one-family houses and dwellings or houses with more than one household (in percentages)*

Source: C.D.V.

Year	'Housing Act' Dwellings		Subsidised Dwellings	
	One-family houses	Dwellings in houses with more than one household	One-family houses	Dwellings in houses with more than one household
	%	%	%	%
1954	48	52	75	25
1955	55	45	66	34
1956	55	45	67	33
1957	51	49	72	28
1958	47	53	70	30
1959	41	59	69	31
1960	47	53	67	33
1961	48	52	58	42



TABLE II

The average total area in square metres of living rooms, bedrooms and kitchens in dwellings built under the Housing Act and in subsidized dwellings

Source: C.D.V.

Year	One-family houses		Dwellings in houses with more than one household		Total	
	'Housing Act' Dwellings	Subsidised Dwellings	'Housing Act' Dwellings	Subsidised Dwellings	'Housing Act' Dwellings	Subsidised Dwellings
	sq. m.	sq. m.	sq. m.	sq. m.	sq. m.	sq. m.
1954	55	66	47	56	51	63
1955	56	66	48	52	52	61
1956	58	65	50	54	54	62
1957	58	66	50	55	54	63
1958	58	64	50	55	54	61
1959	58	64	50	56	53	62
1960	57	62	49	52	53	59
1961	57	60	49	52	53	57

TABLE III

Ordinary dwellings<sup>1)</sup> listed according to the number of rooms, including kitchens (in percentages)

Number of rooms	1946-1950 %	1951-1955 %	1956 %	1957 %	1958 %	1959 %	1960 %	1961 %
1 and 2	0.8	0.5	0.1	0.1	0.2	0.0	0.0	0.0
3	8.9	8.8	3.6	2.1	2.2	1.6	1.3	1.2
4	12.8	19.6	13.3	12.4	14.3	13.7	13.7	13.1
5	37.0	48.0	52.1	50.9	52.5	51.0	52.5	52.7
6	28.5	15.8	20.4	22.8	20.0	23.2	23.0	24.2
7	9.5	5.7	8.6	10.0	9.4	9.0	8.4	7.7
8 and more	2.5	1.6	1.9	1.7	1.4	1.5	1.1	1.1
Total	100	100	100	100	100	100	100	100
Average number of rooms	5.2	4.9	5.2	5.3	5.3	5.3	5.3	5.3

<sup>1)</sup> All dwellings are 'ordinary' with the exception of dwellings attached to business or industrial premises (farms, shops, workshops, etc.), official residences and dwellings provided by charitable institutions.

## Transport

### Volume and Importance

Passenger and goods transport in the Netherlands falls into three main categories, viz. water, road and rail transport. Inland air transport is of only slight importance owing to the short distances involved. With these three means of communication, intensive transport facilities can be provided throughout the country for ensuring the movement of passengers and goods on a paying basis. In addition, this transport system is of great importance for international commercial traffic through the ports and for traffic by water, rail and road across frontiers.

To ensure that the three branches of transport make reasonable and permanent provision for ever-increasing requirements, and to avoid normal conditions being upset by relentless competition, a transport policy has been in force since 1926 which provides for cooperation between the Government and private individuals.

The principles of this policy are:

that the traffic system of the Netherlands forms a whole; that the three branches are treated equally; that economic principles are maintained; that competition is not more limited than is necessary for a reasonable and permanent provision of transport; that no subsidies are granted to transport enterprises (that is to say, the transport rates must be such that income covers expenditure). The rates in each of the branches of transport are fixed independently of those in the other branches.

This transport policy is implemented through various acts, passed to provide the Government with the necessary powers. A very important instrument in the hands of the authorities is the permit needed to operate a transport business. Such a licence is granted on certain conditions.

The railways are operated by a limited liability company whose share capital is in the hands of the Government. Road transport is the concern of 10,850 firms.

Road passenger traffic is run by 500 companies and in the commercial inland shipping industry, which handles almost exclusively goods traffic, there are 8,800 business concerns. There are also several thousand affiliated businesses. Over a quarter of a million people find employment in the transport industry.

### Goods Transport by Road Traffic

Some 138,000 lorries and 24,000 trailers are in use on the Dutch roads.

The goods traffic is of two types: commercial transport by 'transporters' who move goods for others; and private transport, comprising those businesses that transport their own products.

The road haulage business dates from the end of the First World War. Owing to the advantages of door-to-door delivery without re-loading, this new mode of transport soon became a serious competitor of water and rail transport.



Competition in this field reached its peak during the economic crisis of the 1930's, yet at that time the introduction of the statutory regulations for road goods transport was unsuccessful. In 1940, under the pressure of the German occupation, a carriage licensing system was introduced. This system was continued after the end of the occupation until the Motor Transport of Goods Act came into operation.

By 1945 only 7,000 of the 27,000 motor lorries in use in 1940 were available for commercial goods transport. There was considerable progress after 1945 because the opportunities for business were much greater. In the first few years the trade had to manage with motor lorries from army dumps. When the Motor Transport of Goods Act came into operation on 15 February 1954, everyone who on that date had a licence to operate commercial vehicle transport was given a licence by law, provided that his claims were satisfactory and that he was considered to fulfil the conditions concerning professional ability and solvency.

Persons without 'historical rights' who wish to obtain a licence must comply with the requirements concerning professional ability and solvency. The issue of a licence conferring equal rights is dependent upon the best interests of transport in general, the guiding principle being that all transporters of goods receive just and socially equal treatment.

There are regulations covering subjects that are more specifically in the interests of transport, the most important of these being the Regulations for Goods Transport. Licences are issued by the Goods Transport Licensing Commission in The Hague and the government traffic inspectors. Queries and requests received by the Goods Transport Licensing Commission are discussed in an open session, at which serious complaints can be dealt with.

As far as the law is concerned, commercial goods transport is divided into three parts:

- a. motor lorry services;
- b. collection and delivery services;
- c. irregular transport.

A special licence is required for international road transport.

- a. Lorry services are regular line-services between the places mentioned in the licence.
- b. Collection and delivery services are regular services for the collection and delivery of goods against payment.
- c. Irregular transport is defined as transport of goods by lorry, not falling under a. or b., and which is not private transport. The latter is defined as transport by lorry of goods exclusively destined for, or originating from, one's own enterprise.

#### Irregular Transport

The expression 'irregular transport' can cause misunderstanding. The service need not be irregular at all; livestock transporters make regular journeys to special markets; vegetables and fruit are transported daily to the auctions during the various seasons; the same applies to farm milk that is taken daily to the milk factory, etc.

The main difference between lorry services and the collection and delivery services on the one hand, and irregular transport on the other, is the public nature of the former and the non-public nature of irregular transport.

There is considerable variety and specialisation in irregular transport. For instance, there is the

transport of farm milk (in tankers), fruit and vegetables, sand and gravel (in tipping lorries), oils and fats, liquid asphalt, refrigerator vans for meat and other types of transport. The advantage of specialisation is that it makes for better service, but as the risk and financial outlay are higher in this type of business, there have to be close ties between the transporter and the consignor. Specialisation is now so far advanced that there are hardly any hauliers who confine themselves to the use of one type of lorry. In fact, practically everything is handled by the irregular transport trade, although in the Netherlands railway and inland water transport are more suitable to bulk goods.

#### Size of the Business

Although there is a tendency towards greater unity, commercial goods transport has remained a typical tradesmen's business. Sixty per cent of transporting firms have one or two lorries at their disposal. Not more than five per cent are large businesses. There are 25,000 employees in commercial goods transport (drivers, mechanics and office staff). Maximum tariffs are in force which are fixed by negotiation between the transport industry and the Government.

#### International Haulage

International haulage belongs exclusively to the category of irregular transport. There are about 700 international haulage enterprises, operating principally in Germany, France and Belgium. This transport depends largely on the licensing systems of other countries, with the result that negotiations are continually necessary. Decisions on requests for permits for international haulage have been assigned by decree to the Netherlands International Road Transport Organizations, in which the operators' organizations cooperate in the field of road transport. There are two government representatives on the board of management.

#### Private Transport

Private transport may only take place in lorries which are continuously and exclusively used by the registered owner. An exemption certificate is required for private transport used in international haulage. The granting of registration and exemption certificates is in the hands of the industry. (The Foundation for Private Transport Registration, the Commission for Private International Transport of the General Shippers' and Private Hauliers' Organization.)

Commercial goods transport and private transport have about an equal share in total goods traffic. The number of lorries at the disposal of private transport is somewhat larger than that for commercial goods transport.

The development of international road haulage (commercial and private transport together), by both Dutch and foreign enterprises is shown in the following summary:



International goods transport by lorry (1,000 tons)

1938	1950	1954	1955	1956	1957	1958	1959	1960	1961
928	1,411	3,835	4,358	5,644	6,497	7,167	8,805	10,255	11,904

### Passenger Traffic

In passenger transport the bus meets an urgent need to link the country and the town and also provides for the group transport of workers, schoolchildren, commuters, etc. It must also be regarded as an alternative to interurban tram communication between small municipalities. As in the other branches of transport, a considerable amount of material was taken away during the war, so that of the 4,500 buses available in 1940 a mere 500 remained in 1945. After the war, the bus companies made every effort to meet the demand for passenger transport. By 1959 there were 9,076 buses on the roads with a seating capacity of 340,000, the service being used on average by 45 million people a month. Thanks to a licensing system regulated by the Motor Transport Passenger Act the standards are much higher than before the war. These licences are issued in a similar way to those for irregular goods transport.

### Railways

Rail transport is run by the Netherlands Railways with its headquarters at Utrecht. The State holds the 300 million guilder share capital. This type of management was chosen because the railways need great freedom in handling their affairs in view of changing economic circumstances and keen competition from water and road transport. The membership of the company's board of directors consists of senior civil servants and private persons. The latter group of members are appointed solely because of their personal qualifications and their knowledge of the various sectors of the national economy.

The present form of management developed gradually. The first railway was put into operation in 1839 between Amsterdam and Haarlem and run by a private company. Ten years later a line was built between Amsterdam and Arnhem, also operated by a private company. After 1863 the network of railways spread rapidly because the Government took over the construction of railway lines, and a Company for the Exploitation of Government Railways was established. Finally, all the private companies were combined into the Netherlands Railway Company. The two companies competed keenly against each other to the detriment of the economic position of the industry. In 1917 a combine was started and 20 years later it was decided to establish a company called the Netherlands Railways in which the Government obtained all the shares. The table below gives a survey of the annual results of this company:

TABLE I

Year	Total income	Profit
1946	fls. 262.9 million	fls. 7.9 million
1947	fls. 285.5 million	fls. 8.9 million
1948	fls. 289.0 million	fls. 0.0 million
1949	fls. 285.7 million	fls. 0.9 million
1950	fls. 317.2 million	fls. 1.4 million
1951	fls. 331.9 million	fls. 0.1 million
1952	fls. 354.0 million	fls. 5.5 million
1953	fls. 373.9 million	fls. 4.8 million
1954	fls. 406.0 million	fls. 2.6 million
1955	fls. 454.9 million	fls. 10.6 million
1956	fls. 488.2 million	fls. 10.4 million
1957	fls. 506.7 million	fls. 3.5 million
1958	fls. 493.1 million	fls. 0.2 million
1959	fls. 497.7 million	fls. 9.9 million

The capital invested in the railways as a whole amounts to about 1,760 million guilders.

### Railway Network

Railroad construction in the Netherlands is facilitated by the flat countryside. There is, however, one difficulty: the softness of the subsoil. To overcome this, drastic steps had to be taken. In some places, sections of the line had to be strengthened by means of reinforced concrete or slag, the latter being a product of the blast furnaces. Another method was to cart away all the soft subsoil and fill the resulting trench with sand.

Considerable use is now being made of crushed gravel, a product of Holland, for railroad ballast beds. For the track itself, the type of rail generally used weighs 46.5 kilogrammes per metre and is 30 metres long. The length of the railway network in 1959 was 3,229 kilometres, of which 2,485 kilometres were operated for goods and passenger traffic and 744 kilometres for goods only.

Because of the many rivers and canals in the Netherlands, railway bridges are important. There are now 20 large modern bridges and about 1,200 smaller ones. Some of the bridges are movable, to accommodate shipping. Many roads are spanned by viaducts.

Much attention is being paid to the electrification of the railway network in the Netherlands. More than 1,600 kilometres of the network have now been electrified, which is over half the total amount of track. Diesel traction is employed for other lines carrying less traffic. By the end of 1958 the plans for electrification and for the use of diesel locomotives had been completely carried out by the Netherlands Railways. From that moment steam traction was abolished. The railways' earning power has thus been considerably increased. After Switzerland, the Netherlands has relatively the densest network of electrified track in Europe.



### Repair of War Damage

The equipment of the Netherlands Railways was very badly hit during the war. Stations, bridges and the whole of the railway network suffered considerable damage. One of the consequences was that, after 1946, an enormous repair and renewal programme had to be carried out. Between 1945 and 1952, investments for this amounted to 1,044 million guilders, part of which was paid out in compensation by the State. But most of the financing came from the Railways' own resources, loans being obtained for the remainder of the amount needed.

### Rolling Stock

The Netherlands leads Europe as far as rolling stock for passenger transport is concerned. Wooden carriages were abolished in 1955. The electric and diesel-electric train units are comfortably fitted out and all compartments have sufficient room, even for a lot of hand luggage. Each carriage has its own toilets and each compartment its own heating system operated from a central point. The rolling stock of the Netherlands Railways comprises more than 700 locomotives, 1,880 carriages, more than 500 luggage vans, 94 mail vans and more than 21,000 goods wagons.

### Passenger Transport

The number of seats for passengers amounts to 116,000, which is 35,000 less than before the war. A proof of higher efficiency and better management is the fact that this figure of 116,000 is sufficient, despite the fact that the number of people using the railways has doubled since 1939. The annual number of passengers transported is now between 180 and 190 million, or half a million a day.

In contrast to many other railways, passenger transport is the major source of income for the Netherlands Railways. This is due to severe competition from the inland road and water goods transport industries. In 1959, proceeds from passenger transport amounted to 266 million guilders. The passenger timetables are designed to a fixed hourly pattern, based on frequency, regularity and connections. The services are so arranged that there is at least one connection an hour between any two stations.

### Goods Transport

Goods transport takes place mainly during evenings, nights and early mornings. The advantage of this is that the electric locomotives used for pulling heavy goods trains can be used in the day-time for passenger transport over long distances.

Table II gives an impression of the scope of Dutch goods transport.

The proceeds from goods transport in 1959 amounted to 201 million guilders.

The goods transport is organized roughly as follows. A number of towns – the most important

railway junctions – are designated as 'group head stations'. Each of these has under it a group of stations. All goods transport in the consignor's group is taken to the group head station, transported from there by main line to the main station of the addressee's group, and then sent to its final destination.

TABLE II  
*Inland goods transported by Netherlands Railways in 1959*

	(1,000 tons)	(%)
Agricultural produce	897.1	6
Other foodstuffs and luxury goods	541.3	3
Fertilizers	739.8	5
Building materials	665.5	4
Raw materials and industrial products	1,343.1	8
Solid and liquid fuels	1,043.7	7
Joint loads and combined loads	8,902.2	57
Other goods	1,569.2	10
Total	15,728.9	100

For parcel traffic the Netherlands Railways have a subsidiary company at their disposal, the N.V. Algemene Transport- en Expeditieonderneming Van Gend en Loos.

With other transport companies, this company operates part of the collection and delivery services on behalf of the railways. It also operates a network of road transport services, thus linking 60 of the larger towns. This is done in order to strengthen the position of the Netherlands Railways on the transport market.

### Staff

The Netherlands Railways have a staff of 32,000 men and women. A point of special importance is that railway staff are not allowed to strike. The Netherlands Railways have their own school where all the various railway occupations are taught.

### International Co-operation

The Netherlands Railways take part as much as possible in international co-operation on railway matters. They are members of the Union Internationale des Chemins de Fer, the Union's bureau for technical research (ORE) being located at Utrecht.



The Netherlands is one of the 16 Western European nations to establish an international financing company for standardised material. The Netherlands is also a member of the European pool set up in 1953 to achieve a more economical use of goods waggons in international traffic. A plan for running fast international freight trains, called 'Trans-Europe Express Merchandise' (TEEM), was drawn up in 1959. This plan is supported by a number of European railway undertakings including the Netherlands Railways. This plan was implemented in 1961. It has resulted in a considerable speeding-up of international goods transport on international networks. In the field of international passenger services the Netherlands Railways operate, with other European railway companies, tourist bus services throughout Europe (Europabus).

## Transport by River and Canal

Transport by barge occupies a very important position in the Netherlands. When it is remembered that the Netherlands, after it had been wrested from the water, required a tight network of waterways for the removal of excess water from the low-lying land to the sea, then it can be understood why inland water transport developed to such an extent in this country. Over the years these waterways were steadily improved and adapted to the needs of traffic, with the result that, nowadays, there is an excellent water transport system. Nearly all the provinces of the country can be reached by a waterway capable of taking ships of at least 1,000 tons deadweight. There are, moreover, many huge waterways with an almost unlimited capacity. Transport by barge is still the cheapest form of transport. Indeed, no further emphasis is required to show that the existence of a perfect water transport network is, and will be for some time to come, of the greatest importance for the development of trade, industry and agricultural production in the Netherlands.

Before the advent of rail and road transport, the inland waterways were practically the only means of communication between towns and villages. It has thus been of major importance in the opening-up of the country and in the establishment of contacts between the populations of the various districts.

The use of steam, followed later by electricity and the combustion engine, naturally had a great influence on inland shipping. Above all, account had to be taken of the steady increase in speedier transport both by rail and by road. The latter forms of transport have taken over almost all the passenger traffic and a good deal of the goods traffic from the barges. But the dynamic development of commercial traffic and the rising production of both industry and agriculture were accompanied by a still greater demand for transport, especially for the movement of bulk goods for which the barge is outstandingly suited. Inland water traffic was able to adapt itself successfully to these new conditions and succeeded in holding on to its leading place in this field. In fact, it has even strengthened its position, and this in spite of ever-increasing competition from the railways and lorries.

The total tonnage carried in the Netherlands in 1959 by the three transport systems – rail, road and water – was 241 million tons. Of this figure, water traffic accounted for 129.4 million tons

(54%). This transport achievement is equivalent to a total of 24,500 million ton kilometres, of which 17,300 million (72%) was handled by inland water transport. The Netherlands inland fleet carried about 94 million tons of this amount, the remaining 35 million tons being handled by German, French, Swiss and Belgian barges. These figures become even more significant when one considers that total barge traffic in Western Europe (The Netherlands, France, Belgium, West Germany and Switzerland) was 283 million tons, after due allowance has been made for goods which have crossed national borders and been counted twice and for goods which are in transit. From the above it is clear that inland water transport plays an important part not only in regional and national transport arrangements in the Netherlands (53 million tons) but also in international traffic to and from neighbouring countries. This latter traffic serves not only the direct import and export trade of the Netherlands but also especially the transit trade. From the great Netherlands ports such as Rotterdam and Amsterdam millions of tons of goods pass annually to the hinterland, especially to West Germany, Switzerland and France. The Netherlands owes this to her favourable geographical position and to the fact that the hinterland can be reached direct from the ports by means of the river Rhine, rightly called the 'artery of Europe'. The dynamic development of industries along the river and its tributaries and connecting canals is certainly due to a large extent to the economic advantage that the ports of the Netherlands and connected inland water transport systems have been able to offer.

## National Transport by Barge

This type of transport can be broadly classified into the following categories.

First of all comes tramping (in 1959 : 19 million tons) which can be compared to ocean tramping. Chartering in this trade is done through the state-controlled shipping exchanges. A shipper has to offer his cargo for transport at one of these exchanges so that it can be considered by the skippers. The rate for the job is set by a quotation committee, on which shippers and transporters are equally represented, and the rate has to be within the government-fixed margin for the basic tariff. In special cases, however, permission can be granted for shipments to be put up for direct bids on the market. Goods carried by this service consist of whole or partial shiploads of products of every sort and kind. More often than not they are bulk goods such as sand, gravel, coal, grain, metal goods and fertilisers.

Then there is the regular barge service (in 1959 : 2.6 million tons). This trade is handled by ships which sail between fixed destinations on a regular service and is generally worked in combination with a motor transport company. A regular barge service is run with a view to co-ordinating water and road transport for certain types of business and is usually protected by ancient charters. Boats are chartered at standard rates.

Special transport (in 1959 : 7.5 million tons) is a type of transport in which, because of special relations between boat owners and shippers and the regular transport arrangements of certain businesses, permission is granted for the cargo to be handled without reference to a shipping exchange. For instance, the seasonal traffic in potatoes and sugar beet from the farms to the factories in autumn comes under this heading.

Private transport like tanker transport, is practically uncontrolled. In 1959 these types of transport handled 24.4 million tons in all.



### International Transport by Barge

This transport was in 1958 upwards of 76 million tons. Of this, 28.6 million tons were Netherlands imports and exports, 33 million tons were transit goods having been transhipped in Netherlands ports and 13.5 million tons in transit without transhipment. The overwhelming importance of the Rhine and its tributaries is apparent from the fact that 59 million of these 76 million tons were transported into and out of the Netherlands via the Rhine.

In this connection it is worth mentioning the Revised Rhine Traffic Act drawn up in 1868 between the Rhine riparian states. By virtue of this agreement, navigation on the Rhine and its branches is open to ships of every nationality, the ships receiving the same treatment in every respect regardless of their country of origin. The Central Rhine Traffic Commission, which has its headquarters in Strasbourg and on which each of the participating countries is represented supervises the correct observance of this agreement and draws up regulations essential for general safety. The Rhine traffic statute has greatly contributed to the prosperity of Rhine shipping and to the development of those regions which receive or despatch their goods along this waterway. The Netherlands inland fleet has long had a considerable share of Rhine transport. Upwards of 49% of the Rhine traffic crossing the German-Netherlands border is under the Netherlands flag. There is dense shipping traffic at the border posts. At Lobith alone 14,600 tons, 35,000 towed barges and 112,000 self-propelled barges with a total power output of 41½ million h.p. pass annually. Bulk goods, in particular, are transported in millions of tons. These goods, destined for all parts of the world, include coal, ores, wood, grain, liquid fuels, chemical products, fertilisers, gravel, semi-finished products from the iron and steel industry and many kinds of piece-goods. On the Maas and the Scheldt there is also a thriving inland water traffic with Belgium and Northern France. Here again, those engaged in this trade are free to set their own conditions.

### The Traditions and Training of Skippers

Netherlands skippers are individualists with a strong desire for independence. It is their work that produces this mentality. In the skipper's profession, tradition plays a major role. For centuries, the skill has been handed down from father to son. That is why it is a typical family business. The skipper usually lives on board with his family and so does the crew, space permitting. On the smaller boats the wife works side by side with her husband. Naturally, the schooling and technical training of the children on these boats present many difficulties. A skipper has no permanent home. Therefore, in several of the large harbours the skippers' unions, with government support, have set up schools ashore or on a ship. If a skipper had to send his children to a boarding school, it would mean a heavy financial sacrifice for him, and the difficulties involved in family separation also have to be taken into account.

There is, however, a Royal Education Fund, set up in 1921 by the skippers' unions for the inland shipping industry and subsidised by the Government, which makes provision for general elementary education and technical training. Administration of the fund is divided up into various sections and the employers' and workers' organizations have representatives on the committees of those sections. Elementary education is so arranged that the children can enjoy





a normal education regardless of whether the family lives on board a ship. If the children are separated from their family and have to live ashore, the Government pays part of the cost of accommodation. A number of technical training schools have been established which have training ships at their disposal. In addition, correspondence courses are provided and the skippers give practical tuition to the pupils. Examinations are held under government supervision.

### Statutory Regulations

The inland shipping industry has long had its special problems. It is naturally very sensitive to economic fluctuations because these cause great variations in the demand for the more or less fixed amount of cargo space. Added to this is the fact that the demand for cargo space changes greatly with the seasons, for instance when agricultural produce or household fuel have to be transported. The inland shipping industry must, however, so adjust its cargo space that it can deal with the maximum demand. It should also be remembered that the boats cannot be fully loaded when the water-level is low. Then again, because of the great number of small and large enterprises, there is keen competition between them in times when demand for cargo space is relatively small. All this has contributed to the fact that the Government has, from an early date, concerned itself with the fortunes of the inland shipping industry.

Round about 1920 it became apparent that the regular barge service incurred considerable losses as a result of competition from motor transport firms. Many of the companies operating a regular barge service switched over to the lorry business and this, in turn, led to a further weakening of the inland shipping industry. But, above all, it was during the crisis of the 1930's that great difficulties confronted the inland shipping industry. Many ships had to be laid up, or if they were still used it was at very low cargo rates. Industry appealed to the Government. The answer was the Proportional Cargo Allocation Act. Charters for national transport were issued to regional chartering committees to which the skippers had to report. Private transport and transport for a regular customer were excluded from this arrangement. The most urgent cases were perhaps relieved through this system but many difficulties still remained. For example, the disposal of old and unremunerative ships proceeded very slowly and the world slump proved to be of long duration.

The international shipping industry attempted to find a solution on an international basis, but without success. During the war, the international transport trade also had to be government-controlled. After the war, this international traffic took a long time to get back into normal working order, with the result that there was talk in international circles of a latent crisis. Then in 1952, a conference was held under the auspices of the Central Rhine Traffic Commission on the economics of the Rhine traffic. Governments, employers and employees were equally represented at this conference. The commission produced a number of recommendations which have since been partially put into effect. The industry established long-term conventions for various standard types of Rhine transport and it is expected that these will have a stabilising effect on freight chartering. However, as the economic situation has since taken a turn for the better as far as international inland shipping is concerned – and the talk is now of full employment – the recommendations of this conference for combating specific crisis conditions have not been put into practice. There are regulations concerning the safety of naviga-

tion, the building and the fitting out of ships, transport of hazardous goods, transport of liquid fuels, transport of bonded goods and the issue of skippers' licences. But, apart from these, the Rhine shipping industry is not overwhelmed with restrictions and just like other international water transport systems is uncontrolled as regards the operation of ships. As regards national transport in the Netherlands, the earlier regulations were replaced in 1954 by the Inland Water Transport Goods Act which places this type of transport under a licensing system. The application of this act in practice has already been outlined. This act comprises regulations to prevent unnecessary damage to general transport interests. The inland chartering exchanges still remain in the hands of the Government, but it is the intention gradually to hand over the government stake in them to the industry as soon as the contact between shippers and shipowners offers sufficient guarantees that government intervention is no longer needed. The Government insists that the conduct of business be restricted as little as possible.

### Ports

Most important maritime ports in the Netherlands are municipally owned. The municipalities look after the construction and maintenance of basins and quays and develop sites for building, leaving it to private industry to perform the port functions of transshipment, storage and distribution. Therefore, it is an exception when municipalities perform these functions themselves.

The costs incurred in the construction and maintenance of the entrances to the seaports are often borne by the Government. What port equipment is acquired by the municipal authorities is let to private companies and not operated by the municipality.

In large Dutch seaports, the administration of the ports is entrusted by the corporation to municipal port authorities. In principle, they have to see to it that the cost of municipal port operations is covered by the receipts (mainly harbour dues and wharfage). For the financing of expensive repairs and extensions the port authority has to rely upon the municipality. On the sums obtained in this way interest and amortisation rates are due.

The rates of charges for harbour dues and wharfage are determined by the municipal port authorities and require the approval of the Central Government.

In 1962, 116.3 million tons of goods were handled in Netherlands seaports, of which 101.4 million tons were handled in Amsterdam and Rotterdam. Of those 101.4 million tons 63.1 millions were national traffic, i.e. Dutch imports and exports through the maritime ports. Consequently, over 60% of Holland's 104.1 million tons of imports and exports were carried through the ports of Amsterdam and Rotterdam.

Transit traffic through those ports amounted to 38.3 million tons in 1961, of which approximately 24.7 million tons were destined for or came from the Federal German Republic.

### The Inland Fleet

Before 1940, the Netherlands inland fleet had upwards of 20,000 boats at its disposal with a total deadweight of five million tons. During the last war, thousands of boats were used to block canals, were badly damaged by other means or were sunk. Thus, at the end of the war there was



much work to be done in order to salvage these ships, to bring back to the Netherlands all the ships that had been removed from the country during the war and to repair them. About 700,000 tons had to be written off. But in less than 5 years after the war no fewer than 9,000 barges had been repaired and put back into service. The inland fleet consisted in 1959 of over 18,100 vessels with a total deadweight of 4.9 million tons and a total power output of 966,000 h.p.

The composition of this fleet varies considerably both in type and tonnage class. The number of boats used for the transport of dry cargo amounts to 13,800 totalling 3.89 million tons and 800,000 h.p. There are 889 tankers totalling 373,400 tons and 131,200 h.p. The number of boats, such as dredgers, used for the upkeep of rivers and canals is 1,225 totalling 391,500 tons and 16,000 h.p. Finally, 2,769 boats are used for local traffic in harbours and have a total tonnage of 209,000 and a total h.p. of 16,000.

In all, there are about 9,500 self-propelled vessels. Altogether 8,075 of these ships average a deadweight of 400 tons each and 1,396 exceed that figure up to a deadweight of 2,100 tons. Some of them may develop as much as 1,800 h.p.

In addition, a further 1,772 boats are equipped with light engines. These boats can be towed whenever their own power is insufficient. Nearly all of them are small boats not exceeding 600 tons, with engines of up to 100 h.p.

The number of engineless boats, which therefore have to be towed by tugs or motor boats, is about 6,900 with a total deadweight of 2.6 million tons, some weighing as much as 4,000 tons. About 2,200 tugs are used for pulling barges, for towing river vessels and ocean vessels into harbour and for moving floating equipment such as derricks, cranes and dredgers; their total horsepower is about 360,000. Steam tugs are being replaced increasingly by motor-powered tugs, which are more economical, particularly on account of lower fuel costs and the smaller crews required.

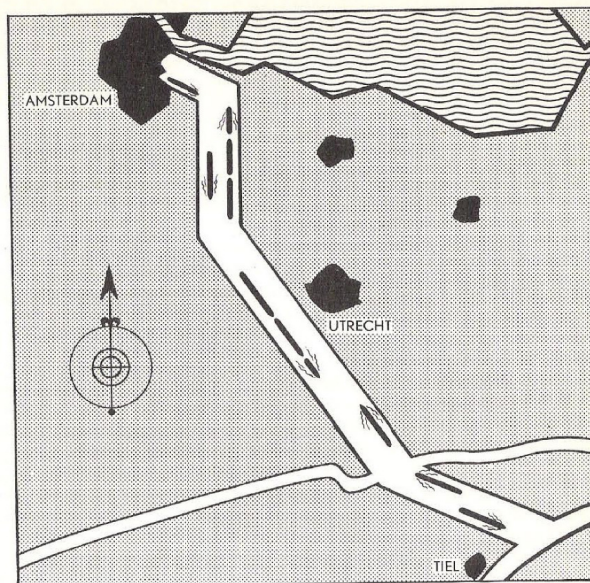
The majority of these boats were built in Netherlands yards which can rightly boast of great experience. In the past the boats were made of wood but for many years now they have been built of iron and steel. Moreover, they are often welded in order to save weight. For the same reason, aluminium and other light materials are being used increasingly for the construction of hatches and living quarters.

The recent application of radar as a navigational aid is proof that the inland shipping industry is keeping abreast of the times.

#### Transport Enterprises

The businesses and related enterprises concerned with water transport number about 10,600. They give employment to 70,000 people. Indirectly, inland shipping provides employment for a larger number of people.

Initially, it was only the owner-skipper who acted as transporter. After the introduction of the steamship, however, and as heavy industry began to develop, larger shipping companies were established. This tendency still continues on account of the large amount of capital that now has to be invested in inland shipping because of increased shipbuilding costs. Of the total carrying capacity of the inland fleet, 60% is in the hands of owner-skipper and 40% is run by shipping



The canal connecting Amsterdam with the river Rhine. Amsterdam-Rhine Canal.



companies. These shipping companies are frequently associated with maritime companies or large concerns and mainly handle the transport work of those companies, although they also operate in the open market, especially as regards international inland water transport. In this case, they hand over part of the transport to owner-skippers, either on a 'per trip' or 'per successive trip' basis, or they hire such boats.

Owner-skippers also handle cargoes in international trade through charterers and shipping agents.

The larger shipping companies are affiliated to the Central Bureau for Rhine and Inland Navigation at Rotterdam. This organization attends to the general interests of the shipping companies in both national and international transport.

Owner-skippers and the small shipping companies belong to one of the various skippers' unions. These skippers' unions are in turn affiliated to the Foundation for Netherlands Private Inland Shipping in Rotterdam, which deals with national inland water transport. They are associated with the Foundation for Netherlands Private Rhine Transport, which has its offices in Rotterdam and is concerned with international inland shipping. Both organizations look after the general interests of their members; in addition, they contract for transport work in order to share it amongst their members, the work being obtained either by subcontracts with shipping companies or direct from the shippers.

The organization for the regular barge service is the Netherlands Inland Shipping Bureau in The Hague. The tug owners have similar organizations. The above organizations are in turn associated with the Foundation for Central Management of Inland Shipping. This organization attends to all matters concerning the whole of the inland navigation system, in particular in the international field, and is also linked to the international organization for inland navigation, the Union Internationale de Navigation Fluviale.

## Roads, Rivers and Canals

Good communications are essential to the economic development of a country. For centuries the Netherlands has possessed both a network of natural and man-made waterways and a network of highroads.

In tracing the history of these road and water communications, we must draw a distinction between the eastern and western parts of the country. Most of the western part of the Netherlands consists of polders: drained marshland surrounded by dikes. The earth of the reclaimed land was none too firm in many areas and the dikes were consequently preferred as sites for house-building. Dikes constituted important links between centres of habitation and the roads that joined the towns in the west of the Netherlands were 'dike roads'. The dike roads proved satisfactory until the advent of motorised traffic; the drawbacks then became apparent. For the roads were tortuous and had not been designed for the convenience of traffic. Moreover, the crown of the dikes was seldom more than 25 ft. broad and could not be widened, for the dikes were sometimes a good 18 ft. high. Moreover, the subsoil was often spongy and could not take the heavier traffic.

Between 1926 and 1930, therefore, an entirely new road network was built for inter-urban motor traffic. The lines of communication were thus made shorter and straighter, inter-urban roads no

longer had to carry the whole or part of the local traffic and road junctions could be reduced in number.

The situation was quite different in the eastern part of the country. The roads were straighter, for as a rule there were no dikes, and the sandy ground provided a firm foundation, which meant that the roads could be adapted at comparatively little expense to the needs of heavier traffic. But there were also disadvantages: the roads passed through towns and villages and were thus used by local traffic as well, and it soon became apparent that the roads to which improvements had been made were not as safe as the completely new roads in the west of the country. It was decided, therefore, that the east of the country should also be given an entirely new road network. Consequently, the whole country is now served by a network of new roads. Motor traffic has shown a rapid increase in volume, especially since 1945, but new methods of constructing roads and improving their safety are being devised all the time. Not only are new roads still being built, but a programme for widening and improving roads of recent construction is also under discussion.

To sum up, we can say that there are two road systems. The old system comprises the dike roads and the roads which grew up between the towns and villages in the east of the country; the new system comprises all the roads built under the new road scheme. Even today, however, the old system performs an essential function by providing a direct link between towns and villages, the roads in question not being subject to much traffic. Moreover, it serves as an auxiliary system for the new roads and is important because it gives tourist traffic access to the typical beauty of the countryside. For this reason, the old roads are maintained and improved as much as possible.

Maintenance of the new roads, and, in general, of the old ones as well, is the responsibility of the authorities: the State, the provinces, the municipalities and the water control boards. This division of responsibility has gradually evolved in the Netherlands and is generally accepted, which is important, for the authorities can thus rely on the support of the public. This simplifies matters from the political angle, for the building and maintenance of roads require a great deal of capital, which has to be raised by means of taxation.

### The National and Provincial Road Plans

The Government is responsible for the maintenance and construction of the great majority of primary roads, which constitute the principal thoroughfares for most non-local traffic. The first national road plan was established by Royal Decree in 1927 and covered 2,904 kilometres. The plan was revised in 1932, 1938, 1948 and 1958. The national road plan of 1958, which includes both existing and projected roads, covers a total length of 3,373 kilometres; this is about 9% of the total length of all roads in the Netherlands.

Besides the national road plan, each of the eleven provinces has its own provincial road plan, for the establishment of which the provincial councils are responsible. The provincial road plans comprise existing and projected arterial roads which do not figure in the national plan. They cover a total length of 4,637 kilometres.

In addition, each provincial council establishes a tertiary road plan which covers those roads not included in the national or provincial road plans for motor traffic within the province itself. The total length of the existing and projected tertiary roads is 5,784 kilometres.



TABLE III  
Existing roads

	Primary roads	Secondary roads	Tertiary roads
State	2,686	55	45
Others	452	4,404	5,643
Total	3,138	4,459	5,688

#### Problems in Road-building

It is the modern tendency in road-building to favour the laying of dual carriage-ways, each wide enough for two cars, for there are far fewer accidents on such roads and cars can travel at greater speeds without greater risk.

The great new traffic arteries that run throughout the country are reserved for motor traffic. Pedestrian crossings are avoided as much as possible, building along the new traffic arteries is no longer permitted and cars and motor cycles can park only in specially designated places. All this helps to keep the traffic moving fast, which is essential in view of the ever-increasing volume of traffic. The following figures will give some idea of how dense the traffic is. Every day 28,000 motor vehicles use the The Hague-Rotterdam road (20 kms.), 18,000 use the roads between Amsterdam and The Hague (50 kms.) and 15,000 use the road from Rotterdam and The Hague to Utrecht (50 kms.), a town in the middle of the country. The number of cars on the road in 1960 was more than  $4\frac{1}{2}$  times that in 1938. According to the latest forecast, the 1960 figure will probably be doubled within the next ten years.

Road construction in the west of the country is both difficult and expensive because the ground is so soft. There is often a soft layer of peat to a depth of 18 metres; only below this depth is sand or hard clay to be found. Consequently, a sand foundation must first of all be laid. There are two ways of doing this. The first method is to pile sand on the ground; the sand then sinks and presses down the soft earth, thus forming a bed of sand that will remain more or less firm. This method is cheaper but less satisfactory than the following one, which is, however, much more drastic. If the depth of soil is more than about six metres, the method is not used, because the costs, in this case, are too high. This method consists of digging out a canal and has the advantage that floating equipment can be used. In fact, the onlooker often thinks that a waterway is being constructed and not a road.

If the soil is somewhat less soft, a cheaper though more precarious method can be employed. A layer of sand is put down, care being taken not to upset the balance of the subsoil. The slight pressure of this sand makes the subsoil somewhat firmer and thus a second layer can be placed on top. The aim is the formation of a floating bed of sand, usually a few metres thick, which can

distribute the weight of the traffic and which does not become too firm. Often, a mat of faggots is first of all put into position; this helps to distribute the weight and prevents the sand from penetrating into the weaker parts of the topsoil.

Bricks were formerly generally used for the construction of the road surface. They were cheap, reduced the danger of skidding and were easy to replace. With the increase in heavy and fast traffic, however, it became clear that bricks were unsatisfactory. Most of the new roads, therefore, are given a surface of cement or asphaltic concrete.

#### Financing

The costs of the roads included in the State road plan are financed out of state taxes. The lower public bodies receive payments from the Central Government to cover the costs incurred by them. The provinces are virtually autonomous as regards the expenditure of sums allocated for roads. Roads not included in a provincial or tertiary road plan must be entirely financed by the public body concerned. For large and expensive improvements, loans can usually be negotiated.

The responsibility for the execution of the state road plan is entrusted to a Directorate-General for Public Works which is under the jurisdiction of the Ministry of Transport and Public Works. When a new road is to be constructed or an existing one improved, the preparatory work (location of site, drawing-up of plans, choice of materials, etc.) is carried out by the Public Works Directorate. The plans are then discussed with the local authorities and put before a commission which has twenty members. On this commission are representatives of the Ministries of Transport and Public Works, of Education, Arts and Sciences (for the preservation of the beauty of the countryside), of Economic Affairs, of Agriculture and of Housing, as well as of organizations in the traffic and tourist field, trade unions, industry and the municipalities. The commission sends its findings to the Minister of Transport and Public Works who has the last word. He usually follows the recommendations of the commission.

The provincial authorities each have their own public works department; these are independent of the State Public Works Directorate and have the same task.

TABLE IV  
Rivers and canals

Maximum distance (in kilometres) that can be navigated by ships of:

	1500 tons and more	1000 to 1500 tons	650 to 1000 tons	400 to 650 tons	250 to 400 tons	150 to 250 tons	80 to 150 tons	less than 80 tons	Total length of waterways
Total at 1 January, 1961	1,044	547	136	837	482	854	890	871	5,661
Large rivers	619	97	—	61	—	—	—	—	777
Other waterways	425	450	136	776	482	854	4890	871	4,884



Almost every part of the country can be reached by ship. Of the inland waterways in the Netherlands, nearly all are controlled by an authority: state, provinces or municipalities.

The Rhine and its tributaries, the Maas, the Scheldt and a large number of major canals are state-controlled; they are kept by the state in good navigable condition. The authority responsible for them is the State Public Works Directorate. Other canals of more regional importance are run by the provincial authorities. The seaports of Amsterdam and Rotterdam are municipally controlled and only a few of the smaller ports are managed by the State.

No tolls are levied on state-controlled waterways; in other words, ships do not have to pay canal dues, lock charges or bridge fees. Shipping dues are levied, however, by the provinces and municipalities and out of these the maintenance costs are met as far as possible. The levying of shipping dues requires Royal Assent.

Besides the responsibility for keeping the waterways in good navigable condition, there is the attention that has to be paid to their beaconing and lighting in order to ensure that they are safe for navigation.

The control of shipping is laid down in a series of state regulations. In addition to these regulations there are also a number of special regulations relating to certain harbours and certain canals. Regulations drawn up by the provinces and municipalities require Royal Assent.

## The Merchant Navy

Two circumstances have led to the Netherlands being a seafaring nation. For one thing, it is located on the coast of a part of the world which for centuries has been one of the most developed from an economic and cultural point of view. Because of its geographical situation the Netherlands forms one of the junctions, so to speak, of the international trade routes to and from all the corners of the earth. The second circumstance is that the Netherlands is densely populated and thus depends on a large import and export trade, the more so because the soil is poor in raw materials. As a result of the first circumstance the Netherlands merchant navy is, to a considerable degree, engaged in the rendering of services to others and thus contributes to the development of other countries. As this is naturally carried out on a commercial basis, the rendering of services to others by the merchant navy is an important source of foreign currency, with which the Netherlands partly finances its imports of raw materials, semi-finished goods and end products. The net amount earned by the Netherlands merchant navy in foreign currency has amounted, during the past few years, to an average of 670 million guilders. This figure does not include the earnings of coastal shipping and the tanker fleet.

The second circumstance – that the Netherlands depends to a large extent on imports and exports – makes a large fleet of merchant ships essential. Nevertheless, it is characteristic that only a modest part of the total quantity of goods carried out of and into the Netherlands is transported in ships flying the Netherlands flag. In 1959 imports into the Netherlands via the seaports, the 'wet' frontier, totalled 39.8 million tons. In the same year the total exports via the seaports totalled 15.4 million tons. The quantity of transit goods unloaded in the Netherlands was 27.2 million tons in 1959; 7.5 million tons of transit goods were loaded. The total loaded and unloaded goods amounted in 1959 to 91 million tons, of which 16.4 million, or 18% were transported under the Netherlands flag.

The first reason why foreign shipping companies carry so large a portion of the goods traffic destined for and passing through the Netherlands is that the traffic is so vast and so international that it would be virtually impossible to handle it with the ships of one country alone. The second reason is that the Netherlands is a great supporter of the freedom of navigation and does not discriminate against any flag whatsoever. In Netherlands seaports, foreign ships have the same facilities and the same obligations as Netherlands shipping. The pilot system and the safety of the approaches, together with their modern equipment, make the Netherlands harbours attractive to ships of every tonnage. The same holds for the facilities in the docks, the well-ordered commercial conditions and the international-mindedness of the people of the Netherlands. In this respect it is important to mention that the Netherlands not only shows itself to be a champion of the freedom of navigation but also continually argues in favour of it in such international organizations as the 'Maritime Transport Committee' of the O.E.C.D. in Paris.

### Size of the Fleet

The Netherlands merchant fleet on January 1st, 1962, consisted of 1,511 ships, totalling 4.6 million g.r.t.



TABLE I  
*Ships being built in Dutch yards for Dutch account*

	Number	g.r.t.
Tankers	12	299,800
Cargo ships	41	230,500
Passenger ships	1	8,500
Total	54	538,800
Coasters	52	24,500
Grand total	106	563,300

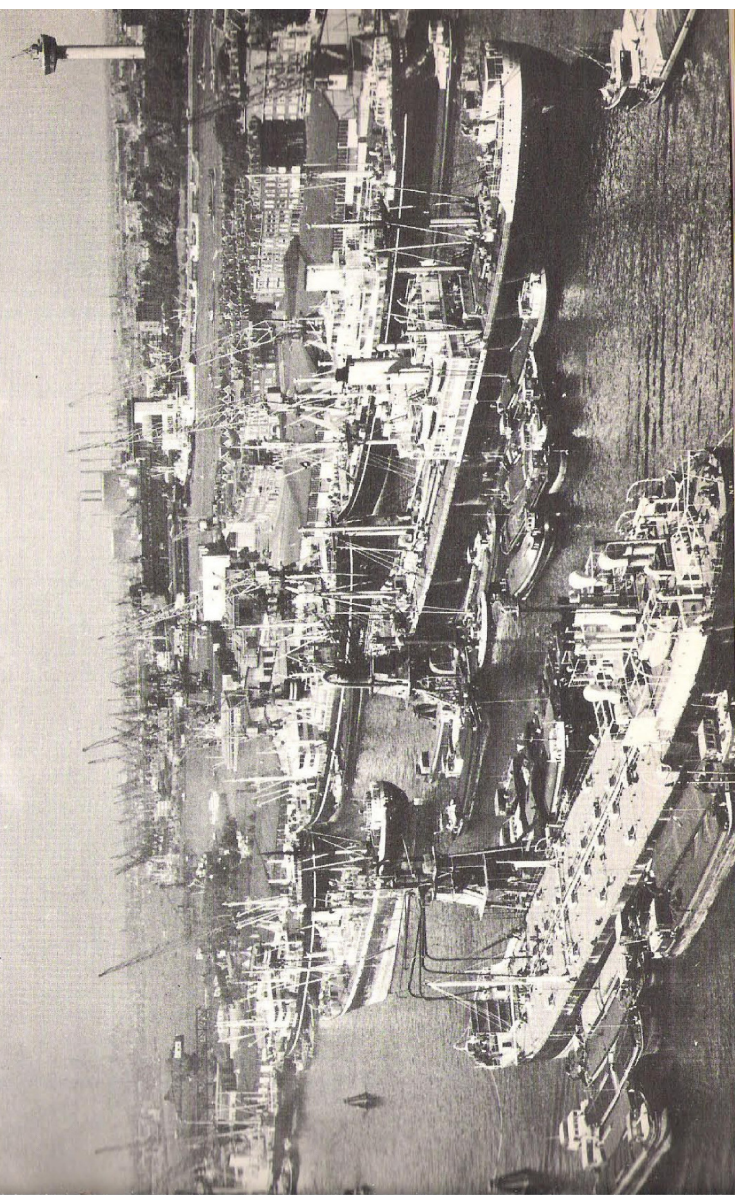
Among the world's merchant navies the Netherlands fleet occupies the seventh position after the United States, Great Britain, Liberia, Norway, Japan and Italy. To reach and hold this position a great deal of work had to be done after the end of the Second World War. At the beginning of the war, the fleet consisted of 1,129 ships with approximately 2,850,000 g.r.t.; at the end it was found that only 692 ships with a total tonnage of 1,618,000 g.r.t. had survived. By making a supreme effort it was possible to replace the lost tonnage, and this was also due in part to the compensation paid by the Government for ships requisitioned during the war. The process of renewal and expansion still continues. On 1st July, 1960, 116 ships with 725,700 g.r.t. were being built for the Netherlands in home or foreign yards. This figure can be broken down as follows:

TABLE II  
*Ships being built in foreign yards for Dutch account*

	Number	g.r.t.	Built in:
Cargo ships	5	45,900	West Germany
Tankers	2	58,000	West Germany
Tankers	2	58,000	Belgium
Coasters	1	500	Belgium
Total	10	162,400	

#### Shipping Lines

Shipping lines account for 56% of all Netherlands shipping. Lines in operation before 1940 were all re-established after 1945. Thanks to the activities and enterprise of Netherlands shipowners, the lines are continuously being expanded or new ones formed. In this connection, one of the most interesting examples is the passenger service between European ports and Australia, which has partly the character of a round-the-world service. The partners in this new and successful service, which was inaugurated early in 1959, are the Royal Rotterdam Lloyd, the 'Nederland' Line and the Royal Dutch Mail, with their well-known liners 'Willem Ruys' and 'Oranje'. In 1960, these shipping companies found themselves obliged to reorganize some of their cargo services as a result of Indonesia's total embargo on Dutch vessels. The Royal Inter-ocean Lines and





the Nederlandse Stoomvaart Maatschappij 'Oceaan' were also hit by this measure. The former company established a new passenger service between the Far East and Australia. For passenger services, this country has specialised in the construction of fast and efficient ships, in contrast to many other countries where shipping companies have concentrated more on tramp shipping. Increasing industrialisation and mounting prosperity in various countries throughout the world have brought in their train many special types of bulk transport for tramp shipping. Netherlands shipowners have therefore specialised in this to an increasing extent. Thus, the ever-growing demand for large cargo ships to transport bulk goods such as ores has led Netherlands shipowners to develop in this direction. In recent years, an increasing number of such bulk carriers have been built for Netherlands account, the vessels varying between 15,000 and 20,000 d.w.t.

#### Coastal Shipping

Since 1945, the coastal shipping of the Netherlands has developed enormously, using ships of less than 500 g.r.t., called coasters. This type of ship has been improved considerably during the past years, so that nowadays practically all the coasters built for Netherlands owners are granted a certificate for unrestricted sailing. It is now quite usual for Netherlands coasters to undertake transatlantic crossings. For instance, they are used for sailings from Rotterdam to the interior of Paraguay and in a new liner service between South America and West Africa. The number of coasters has risen from its 1939 figure of about 500 to its present total of over 900. They carry every kind of cargo, but their main trade is the transport of bulk goods, such as timber, coal, cement and grain. Before 1940, by far the greater part of the coasters were owned and operated by their masters, but this situation has changed in post-war years owing to the high building costs. As a consequence, most ships in this category are now the property of shipping companies and groups of persons.

#### Tankers

Until 1945, the tanker fleet was mainly owned and operated by the great oil companies, Messrs. Phs. Van Ommeren being the only independent owners in those days. After the war, the world tanker fleet increased considerably as a result of the growing demand for oil. Many new tanker companies were established in the Netherlands and some owners of liners and trampships entered the tanker trade. The Netherlands subsidiaries of the oil companies also had new tonnage built. The tendency to build large tankers is also apparent in this country; a number of 39,000-ton tankers are now sailing under the Dutch flag and will be followed by larger ones, including a 77,000-ton vessel for Esso Nederland.

#### Ocean-going Tugs

A special branch of the Netherlands shipping industry is the ocean-going tug service. This can

be divided into two sections, namely, actual towing work and salvage work. The towing consists of moving dredging equipment, dry docks and ships which are to be broken up, to mention only a few examples. Towing one of those unwieldy leviathans is no easy job. Therefore, great experience is a prime requisite. That Netherlands tug masters have reason to boast about this is borne out by the fact that the foremost maritime nations, such as Great Britain, entrust important towing work to them. In general, it can be stated that about two-thirds of the world towage is handled by Netherlands companies. A yearly average of 20,000 tow-miles is no exception. Recently, a Netherlands ocean tug sailed more than 35,000 miles in one year. The salvage work requires that Netherlands tugs be stationed at the most appropriate points, such as the Azores and the Bermudas, whence they can go to the aid of ships in need of assistance. Most of this work, therefore, occurs during the winter season.

#### Passenger Transport

Netherlands shipowners also endeavour to be world leaders in the field of passenger transport. Thus, an important percentage of travellers in Netherlands ships are foreigners.

The Holland-Amerika Lijn was one of the first shipping companies in the North Atlantic trade to have ships built with over 90% of the accommodation in the tourist class. These ships are the 'Rijndam' and the 'Maasdam'. The 'Statendam' was completed at the beginning of 1957 and this ship, which is somewhat more luxurious than the other two, also has 90% of her accommodation in the tourist class. In 1959 the 'Rotterdam' (38,645 g.r.t.) entered the North Atlantic service; she is the flagship of the Netherlands merchant fleet and her building costs amounted to about 130 million guilders.

In 1957 the 'Oranjestad' and the 'Prins der Nederlanden' were completed. They are owned by the Koninklijke Nederlandse Stoomboot Maatschappij and are each of 7,000 g.r.t.; they are used in the service to the Netherlands Antilles off Central America. In 1958 a new ship, the 'Randfontein' was commissioned by the Holland-Africa Line. Since 1947 the Netherlands Government has owned three ships, the 'Groote Beer', the 'Zuiderkruis' and the 'Waterman' which have been used to transport emigrants. They previously did service as troopships. As the Netherlands merchant navy has suffered heavy losses and there was a great demand for shipping space for cheap large-scale passenger transport to other parts of the world, these troopships were equipped for this purpose. They also transported students, and considerable use is made of them for tourist transport. These vessels were transferred to a newly established private company.

#### Financing

The shipping trade is one of the most heavily capitalised branches of industry. Thus, it is understandable that the overhaul and expansion of the fleet has been a heavy burden on the national economy of the Netherlands. The vast sums needed for the reconstruction of ships make it necessary for a major share of the profits to be re-invested in the industry. Since 1945, a total of 4.8 thousand million guilders has been invested in new ships. In fact, a capital investment of 125,000 guilders is now required for each new employee.



### Personel Involved in Shipping and Auxiliary Industries

About 64,000 people are engaged in the shipping industry as a whole. This is 1.5% of the working population.

Of course, merchant shipping provides work for many more people: the shipyards, the engineering works, the textile and furniture factories, etc. At a rough estimate, about a million people are occupied in industries which receive regular orders from shipping companies. Naturally, these orders form only a part of the total activity of these industries.

On the training side, there are nine nautical schools for deck officers and 21 for marine engineering staff. For the initial training of sailors, two non-seagoing training ships, the 'Pollux' at Amsterdam and the 'Nederlander' at Rotterdam, are used. A government committee is at present preparing a report on the revision of the examination syllabuses for deck officers and marine engineering staff.

The Royal Netherlands Shipowners' Association has established the Netherlands Shipping Council, which, together with the organizations of employees, negotiates on collective labour agreements and matters of social security. The cover organizations cooperate in the establishment of collective conditions of employment and in the carrying-out of social legislation.

### International Air Transport

The Netherlands has an air transport company of international repute, KLM Royal Dutch Airlines. The company gained this position in the period between the two world wars under the vigorous leadership of the late Dr. Albert Plesman. KLM owed its reputation not only to outstanding achievements such as the pioneer flights to Indonesia and the Dutch territories in the Caribbean Area, but above all to the technical skill and professional ability of its flight crews and ground personnel, the efficiency of its organization, progressiveness and accurate judgement as to the relative values of this century's transport facilities. When the Netherlands became involved in the war in 1940, KLM was one of the world's leading airlines. More than fifty aircraft, most of them modern for that time, were flying to 61 cities in 29 countries. But for the outbreak of World War II, KLM would have started its first transatlantic service between the Netherlands and the West Indies in 1940. By the end of the first day of hostilities in May 1940, KLM had already been badly hit. Eighteen aircraft were destroyed when Schiphol Airport was bombed and only a few were able to escape to England. Throughout the war years KLM operated from England, maintaining the only air service between England and the Continent – from Bristol to Lisbon and later to Gibraltar – on behalf of the British Government. During these years the West Indies Division based on Curaçao was able to continue operations practically unhindered. Thanks to these activities as well as to the company's excellent reputation and the experience a number of KLM pilots had acquired during their war-time service with the Allies, it was possible to start energetic reconstruction of the Dutch air transport industry when the war in Europe ended in May 1945.

In those difficult days immediately after the war, KLM had very little with which to make a start. Four aircraft were available in Europe, the same number as in 1920 when KLM inaugurated its first air service. Schiphol, the international airport near Amsterdam, lay in ruins. In the tarmac and runways there were 200 bomb craters. But carefully thought-out plans, which had been drawn up during the enemy occupation, were waiting to be put into effect. Realisation of these plans would mean buckling down to the job, for the future of the Netherlands in international civil aviation was now at stake. Rapid communications with other countries were of the utmost importance, not merely for the speedy economic recovery of the Netherlands but also to preserve this country's traditional role in world transport, since even before the war a good reputation had already been established in the air. The years following the liberation of the Netherlands are of much greater significance than those of the pre-war period.

Owing to the tremendous technical advances in aeronautical development during the war, the prospects for civil aviation were far wider than before 1940, and now the four-engined long-distance aircraft had entered the scene. Through prompt appreciation of the potentialities in this respect, the Netherlands was able to regain its former place in world trade and transport, although this meant that first of all an entirely new business had to be built up from scratch.

Thanks to the energy of the Netherlands Government and to the civic authorities in Amsterdam, Schiphol Airport had been so far repaired by October 1945 that it could be opened to air traffic.



KLM then started a number of internal air services, which were maintained for several years until surface transport facilities were again in full operation and the demand for internal air transport had considerably diminished. Six months after the cessation of hostilities, KLM was able to reopen its first intercontinental air route from Amsterdam to Djakarta, Indonesia. On 28 November, 1945, the first Douglas Skymaster left Schiphol bound for Djakarta.

#### Rapid expansion

With Schiphol open to traffic again, the international air services were quickly resumed. By December 1945 KLM was flying to Copenhagen, and in 1946 there was a resumption of services to Brussels, Basle, London, Oslo, Paris, Prague, Rome, Stockholm, Zurich, Curaçao, New York, Rio de Janeiro, Montevideo and Johannesburg.

The KLM air fleet, which in 1939 numbered 45 aircraft, had increased by 1946 to 75, consisting mainly of Dakotas and Skymasters, but also including some Constellations. Within a year after the liberation KLM was already flying to 46 cities in 31 countries, while the total route mileage was nearly double that of before the war. In 1946, the number of personnel expanded to more than three times the 1939 figure and by the end of the year there were 6,627 employees. KLM grew rapidly; there were always more cities to be served, always more countries to be reached, always more employees to be engaged and always more and bigger aircraft – Constellations, Convair 240's, DC 6's, DC 6B's, Convair 340's and Super Constellations. In 1957 the fleet was further strengthened by the addition of nine Vickers Viscount turbo-prop airliners and fifteen Douglas DC 7C; which were probably the last of the long-distance piston-engined aircraft, and in 1960 and 1961 the KLM colours appeared on eleven Lockheed Electras and twelve DC 8 jet airliners.

Schiphol was transformed into an efficient, modern and well-equipped airport with numerous hangars, workshops and the very latest installations; it is now an aviation city with 14,500 workers, of whom nearly 10,000 are employed by KLM. Since 1945, a strong and healthy international air transport business has been built up in the Netherlands, leaving the pre-war KLM well behind.

With a fleet of 100 aircraft, the majority of them modern, the company now operates air services between 104 cities in 68 countries all over the world.

Each day KLM carries an average of 3,900 passengers, 120 tons of freight and more than 10 tons of mail; its air fleet daily covers a distance four times the circumference of the earth and the total production of these operations amounts to over two million ton-kilometres per day.

In the years between the end of World War II and 1961 KLM transported 10 million passengers, 252,000 tons of freight and some 33,000 tons of mail.

Apart from its scheduled flights, which increase in number and frequency every year, the company carried out over 8,000 charter flights during this period. The latter figure includes more than 700 migrant flights, on which many thousands of Dutch citizens as well as foreign migrants flew to such places as America, Africa and Australia. Since 1946 capacity and sales have increased almost tenfold, and compared with 1939 – the last normal pre-war year – they are as much as forty times greater.

In 1939 the available capacity amounted to about 17 million ton-kilometres, in 1946 it was 59 million and by 1961 it had risen to 763 million ton-kilometres. The growth of air freight traffic

TABLE I  
KLM Statistics

	1939	1946	1956	1959	1960	1961
Ton-kms available	16,800,000	59,000,000	406,700,000	540,000,000	641,700,000	763,400,000
Kilometres flown	9,460,000	17,700,000	63,400,000	77,500,000	81,200,000	79,600,000
Hours flown	40,500	69,100	181,000	207,000	203,000	179,000
Average distance per aircraft hour (kms)	233	256	351	374	400	446
Average load capacity per aircraft (kgs)	1,780	3,330	6,420	6,970	7,900	9,600
Number of passengers carried	103,400	323,800	822,000	1,104,000	1,361,000	1,387,000
Weight of cargo carried (kgs)	1,333,000	2,185,000	23,739,000	31,178,000	38,305,000	43,600,000
Weight of mail carried (kgs)	728,000	1,066,000	2,630,000	3,192,000	3,774,000	3,930,000

Traffic on scheduled services		1939	1946	1956	1959	1960	1961
Revenue passenger/ton-kms		5,900,000	33,700,000	161,700,000	208,300,000	247,400,000	257,000,000
Revenue freight (ton-kms)		900,000	2,000,000	63,100,000	87,000,000	105,200,000	125,700,000
Revenue mail (ton-kms)		1,700,000	5,700,000	9,900,000	12,300,000	13,700,000	15,100,000
Total		8,500,000	41,400,000	234,700,000	307,600,000	366,300,000	398,000,000
Route networks in kms		29,400	51,000	243,000	270,000	270,000	270,000
Number of aircraft		51	75	86	103	102	100
Number of cities served		61	46	118	108	108	104
Number of countries served		29	31	74	77	77	68
Number of personnel		1,650	6,630	16,000	17,500	18,600	18,000



has been even more striking: the total for 1939 was 900,000 ton-kilometres, whereas the present figure is 140 times higher than in 1939 and 63 times higher than in 1946 (see Table I on the following page).

Up to 1960, the financial results were very satisfactory. KLM had to rebuild practically the whole of its organization and during this process large sums had to be invested in the fleet and in domestic and foreign installations. To this must be added the fact that world air transport is still developing and new technical advances are imposing heavy financial burdens on the airlines. The impetus given to long-haul air transport, however, has had a favourable effect on KLM's earning capacity. The traffic revenue, which in 1939 was nearly 11 million guilders, had increased almost sixfold by 1946, and by 1960 it was 55 times as large, amounting to approximately 712 million guilders. This is roughly twelve times as much as for all the pre-war years put together. In 1955, KLM had an average daily revenue of one million guilders, due to ever-increasing transatlantic tourist traffic, which in the summer season necessitates six services a day between Amsterdam and New York. Each of the post-war years, with the exception of 1949, showed a profit. The heavy loss in 1949 was caused by the suspension of the normal Amsterdam-Djakarta services on political grounds; the air link with Indonesia then had to be maintained on an uneconomical basis via the island of Mauritius, this route being operated at the request of the Netherlands Government. Following an increase in capital, KLM was able, with Government aid, to show a small surplus the following year. Since then, the financial results have been such that in 1953 the company was able to pay a dividend of 4% on all shares, while the dividends from 1956 to 1959 were 7% and for 1960 5%. KLM is the only non-American air transport company whose shares are quoted on the New York Stock Exchange. It now ranks third among the international airlines and is the second largest international air freight carrier in the world.

For KLM and for the airlines in general, however, 1961 has been an exceptionally difficult year.

Owing to the transition from propeller aircraft to the new jet aircraft, the capacity of the air fleet was greatly enlarged in that year, while the demand for air transportation failed to keep pace with this increase.

The resultant overcapacity has seriously jeopardised the long-standing favourable financial position of KLM. In addition, the Company's financial situation was adversely affected by several other factors, such as the revaluation of the Dutch guilder by approximately 5%.

KLM has decided to consolidate its production at the current level in the belief that the gap between supply and demand will gradually disappear as traffic increases.

A separate problem in civil aviation has been created by the policy, pursued by many countries, of imposing numerous restrictions on foreign airliners as a protectionistic measure. Apart from the fact that this severely handicaps the airlines in their economic activities, its drawbacks are also felt by the travelling public, who are thus prevented from making proper use of all facilities offered by the most modern means of transport.

## Bibliography

### 1. Economic Development. Trade, Industry, Transport

- BEDRIJFSLEVEN, Het, tijdens de regering van H.M. Koningin Wilhelmina, 1898-1938; P. Lief-tinck. Amsterdam, J. Frijda's Intern. Uitg. Ondern., 1938. 425 pp.
- BENELUX, Le; publ. par le Ministère des Affaires économiques; Institut national de la statistique et des études économiques. Paris, 1953. Bibliography, graphs, maps, statistics. (Mémentos économiques, série M. 7.)
- BRUGMANS, I. J., Paardenkracht en mensenmacht; sociaal-economische geschiedenis van Nederland, 1795-1940. The Hague, Nijhoff, 1961. 570 pp. Bibliography, illustrations, statistics.
- COOPERATIVE movement in the Netherlands; an analysis; 2nd ed.; publ. by the Nationale Coöperatieve Raad. The Hague, 1957. 95 pp. Ill., maps.
- DUTCH market, The; a Contimart country report; publ. by the Contimart A.G. International Marketing and Research Company, Zürich, 1959. 43 pp. Maps, statistics.
- FRANKS, H. G., Holland as an industrial country; the story of a national achievement. The Hague, Federation of Netherlands Industries, 1957. 224 pp. Illustrations, maps.
- FRANKS, H. G., Holland's industries stride ahead; the new Netherlands of the 1960's; publ. by the Federation of Netherlands Industries. The Hague, Nijhoff, 1961. 242 pp.
- GUIDE to the establishing of industrial operations in the Netherlands; publ. by the Ministry of Economic Affairs. The Hague, 1961. 81 pp. Graphs, maps, statistics.
- HOLLAND's economy; a statistical portrait; publ. by the Netherlands Government Economic Information Service. The Hague, 1959. 138 pp. Graphs, maps, statistics.
- KOHE, W., Die niederländische Volkswirtschaft heute; ihre Wandlungen seit der Vorkriegszeit und ihr gegenwärtiger Aufbau; bearb. in Verbindung mit dem Nederlandsch Economisch Instituut zu Rotterdam. Stuttgart/Köln, Kohlhammer, 1954. 182 pp. Stat. (Verwaltung und Wirtschaft; Heft 9.).
- NEDERLANDSE volkshuishouding tussen 2 wereldoorlogen; bijdragen tot de heroriëntering van het sociaal-economisch leven; onder supervisie van B. P. Kreukniet. Utrecht/Antwerp, 'Het Spectrum', 1947-1952.
- NETHERLANDS industry, The, since 1945; a record of post-war progress; publ. by the Federation of Netherlands Industries. The Hague, 1953. 112 pp. Ill.
- NIEDERLANDE; hrsg. vom Statistischen Bundesamt. Wiesbaden, 1959. 59 pp. Maps, statistics. (Allgemeine Statistik des Auslandes; Länderberichte.)
- ONDERNEMEND Nederland; zestig jaar ontplooiing 1899-1959; onder red. van M. Rooy; met medewerking van D. Dresden, N. E. H. van Esveld, S. Groenman, et. al.; published on the occasion of the sixtieth anniversary of the 'Verbond van Nederlandsche Werkgevers'. Leiden, Stenfert Kroese, 1959. 388 pp. A 5. Bibliogr., stat.
- PREIFFER, G., Strukturwandlungen und Nachkriegsprobleme der Wirtschaft der Niederlande. Kiel, Weltwirtschaftliches Archiv, 1950. (Kieler Studien, Nr. 14.) 86 pp. Graphs, statistics.



- ROAD to recovery; the Marshall plan; its importance for the Netherlands and European cooperation; publ. by the Ministry of Foreign Affairs; Directorate-general for the economic and military aid programme. The Hague, 1954. 212 pp. Ill.
- TIEN jaar economisch leven in Nederland; Herstelbank 1945-1955. The Hague, Nijhoff, 1955. 332 pp. Stat.
- VIJFTIG jaren; officieel gedenkboek ter gelegenheid van het gouden regeringsjubileum van H.M. Koningin Wilhelmina. Amsterdam, Scheltens en Giltay, 1948. 476 pp. Illustrations, graphs, statistics.
- WESTSTRATE, C., Economic policy in practice; The Netherlands 1950/1957. Leiden, Stenfort Kroese, 1959. 210 pp. Graphs, statistics.

#### *Annual and Occasional Publications*

- CENTRAAL economisch plan; publ. by the Central Planning Bureau, The Hague, 1947-1962. (English edition for the years 1952, 1954, 1955, 1961 also available.)
- NETHERLANDS Bank N.V. Annual report, Amsterdam.
- JAARCIFERS van Nederland; Central Bureau of Statistics, Zeist, W. de Haan. Latest edition 1957/1958.
- MEMORANDUM on the industrialisation of the Netherlands; publ. by the Ministry of Economic Affairs, The Hague, nos. 1-5 in English, nos. 6 and 7 in Dutch.
- STATISTISCH zakboek; publ. by the Central Bureau of Statistics, Zeist, W. de Haan.

## 2. Agriculture

- DAIRYING in the Netherlands; publ. by the Ministry of Agriculture, Fisheries and Food; Agriculture division. The Hague, 1953. 119 pp. Ill., stat.
- DUTCH agriculture; publ. by the Ministry of Agriculture and Fisheries; Foreign agricultural service. The Hague, 1959. 213 pp. Illustrations, graphs, maps, statistics.
- FRANKS, H. G., Bulb facts; the story of Holland's bulbland told in brief. Haarlem/Enschede, 1955. 40 pp. Stat.
- HOFSTEE, E. W., Rural life and rural welfare in the Netherlands; publ. by the Ministry of Agriculture, Fisheries and Food; Division of documentation. The Hague, Government Printing and Publ. Office, 1957. 362 pp. Ill., maps, stat.
- HOLLAENDISCHE Gemüse- und Obstbau, Der, und seine Marktverhältnisse; hrsg. vom Institut für Wirtschaftslehre des Gartenbaues der Fakultät für Landwirtschaft an der Technischen Hochschule. München/Bonn, Bayerische Landwirtschaftsverlag, 1955. 200 pp. Bibliogr., ill., graphs, maps, statistics.

## 3. Draining and Reclamation

- FROM fisherman's paradise to farmer's pride; the Zuyder Zee closed, its bed reclaimed, the polderland settled; publ. by the Ministry of Transport, Waterways and Drainage; Public

Relations and Information Department and the Zuiderzeepolder Development Authority. The Hague, Neth. Government Printing Office, 1959. 114 pp. Ill., maps.

- GRAFTDIJK, K., Holland rides the sea. Baarn. World's Window Ltd., 1960. 64 pp. Ill., maps.
- WAGERT, P., Les polders. Paris, Dunod, 1959. 311 pp. Bibliography, ill., maps, statistics. (Collection 'La nature et l'homme', no. 3.)
- VEEN, J. van, Dredge, drain, reclaim; the art of a nation; 2nd ed. The Hague, 1948. Graphs, illustrations.

## 4. Finance

- DREES Jr., W., On the level of government expenditure in the Netherlands after the war. Leiden, Stenfort Kroese, 1955. 135 pp. Bibliogr., stat. (Thesis, Rotterdam.)
- HENSBERGEN, H. van and J. KOUDJUS., Beschouwingen over openbare financiën en aanverwante onderwerpen. Alphen a/d Rijn, Samsom, 1957. 352 pp. Stat.
- JONGMAN, C. D., De Nederlandse geldmarkt. Leiden, Stenfort Kroese, 1959. 338 pp. Bibliogr.
- MEMORANDUM on the condition of the Netherlands State finances pertaining to the draft budget; publ. bij the Ministry of Finance, The Hague.

## 5. Housing in the Netherlands

- BAUEN in den Niederlanden. Baumeister, Zeitschrift für Baukultur und Bautechnik. Callwey, Munich, 1958. 48 pp. Ill., plans. (Baumeister no. 4, April 1958.)
- BLIJSTRA, R., Netherlands architecture since 1900. De Bezige Bij, Amsterdam, 1960. 99 pp. Ill.
- BROWN, T. M., The work of G. Rietveld, architect. Bruna, Utrecht, 1958. 210 pp. Ill.
- BUILDING in the Netherlands; a survey of post-war building activities. Bouwcentrum, Rotterdam, 1959. 72 pp. Ill., graphs, statistics.
- DEPARTMENT of Public Works and the Housing Department of Amsterdam. Town planning and housing in pictures. Amsterdam, 1950. 50 pp. Ill., plans.
- HABITATION 1945-1955, Nederland, Pays-Bas, Netherlands. Programme, Projet, Production. Bouwcentrum, Rotterdam, 1955. 135 pp. Ill., plans.
- OUDE, J. J. P. Mijn Weg in 'De Stijl'. Nijgh en Van Ditmar, The Hague, 1961. 38 pp. Ill.
- REINHARDT, H., The story of Rotterdam; the city of today and tomorrow. Public Relations Office of the City of Rotterdam. Rotterdam, 1955. 49 pp. Ill.
- RICHARDS, J. M., New towns in the Netherlands. Unilever Limited, London, 1956. 11 pp. Ill., plans. Reprinted from the Autumn 1956 issue of Progress, the magazine of Unilever.
- THE HAGUE builds. Municipal Bureau of Statistics and Information, The Hague, 1950. 28 pp. Ill., plans.
- UNION Internationale des Architectes. (International Union of Architects) Addresses delivered at the inaugural session of the 4th congress at The Hague, July 1955. 37 pp.
- VRIEND, J. J., Modern Country Houses in the Netherlands. Kosmos, Amsterdam, 1956. 32 pp. Ill., plans.
- VRIEND, J. J., Building in the Netherlands. Moussault, Amsterdam, 1959. 192 pp. Ill.
- WEDEROPOUW van Rotterdam. Genootschap 'Architectura et Amicitia' and the 'B.N.A.' Van Saane, Amsterdam, 1953. 74 pp. Ill., plans. Forum, no. 4/5, 1953; with summary.



## Statistics in Brief

<b>Official name:</b>	Kingdom of the Netherlands (Koninkrijk der Nederlanden)
<b>Reigning monarch:</b>	Juliana Louise Emma Marie Wilhelmina, Queen of the Netherlands, Princess of Orange-Nassau
<b>Government:</b>	Hereditary and constitutional monarchy; Parliament, called the Staten-Generaal, consists of two Chambers
<b>Seat of government:</b>	The Hague
<b>Capital:</b>	Amsterdam

Parts of the Kingdom	Capital	Area in sq.km	Population (1.1.62)
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### In Europe:

The Netherlands	Amsterdam	33,581	11,721,416
<i>a) Provinces</i>			
Groningen	Groningen	2,326	481,740
Friesland	Leeuwarden	3,395	483,162
Drenthe	Assen	2,646	319,619
Overijssel	Zwolle	3,812	795,635
		(incl. North-East Polder)	
Gelderland	Arnhem	5,029	1,314,078
Utrecht	Utrecht	1,327	697,450
North Holland	Haarlem	2,673	2,098,514
South Holland	The Hague	2,888	2,755,724
Zealand	Middelburg	1,773	284,571
North Brabant	's-Hertogenbosch	4,955	1,543,395
Limburg	Maastricht	2,220	911,568
<i>b) Zuyder-zee polders</i>			
North-East Polder	Emmeloord	480	29,224
Eastern Flevoland	Lelystad	537	1,036
Population with no fixed residence, living in caravans and houseboats, shipping population etc.)			5,700

### Overseas

#### Self-governing

Surinam (31.12.59)	Paramaribo	142,822	264,372
Neth. Antilles (1.1.61)	Willemstad	961	194,371
Curaçao	Willemstad		125,094
Aruba	Oranjestad	872	58,743
Bonaire	Kralendijk		5,812
St. Martin	Philipsburg		2,728
St. Eustatius		89	1,014
Saba			980

### Municipalities with 100,000 inhabitants and over (1.1.62):

Amsterdam	865,703	Tilburg	140,261
Rotterdam	730,225	Nijmegen	134,143
The Hague	605,213	Enschede	128,780
Utrecht	258,255	Arnhem	125,960
Eindhoven	172,388	Breda	111,546
Haarlem	170,373	Apeldoorn	107,240
Groningen	147,731	Hilversum	102,676

### Religion (1960):

Protestants 37.6 %, Roman Catholics 40.4 %, other creeds 3.6 %, no religion 18.4 %

### Money:

Guilder (Dutch: gulden) = appr. £ 0.20.

Abbreviation: fl.

fl. 10.00 = Tientje fl. 0.10 = Dubbelje

fl. 2.50 = Rijksdaalder fl. 0.05 = Stuiver

fl. 0.25 = Kwartje fl. 0.01 = Cent

The total agricultural area (May 1961), in hectares, is:  
2,314,236

### Number of holdings (May 1961):

300,157

### Average yield per hectare (1961):

Wheat	3,925 kg	Barley	3,756 kg
Rye	2,521 kg	Potatoes	28,340 kg
Oats	3,508 kg	Sugar beet	45,458 kg

### Livestock (December 1961):

Cattle	3,388,000	Sheep	284,000
Pigs	3,187,000	Hens	37,187,000
Horses	165,000	Ducks	1,231,000

### Agricultural products (1961):

in thousands of metric tons

Meat (1950)	685.9	Butter	96.6
Eggs	299	Cheese	213.3
Milk (all milk products)	6,953	Condensed milk	408.1
		Milk powder	103.0

### Fisheries (1961):

Quantity 301.1 in thousands of metric tons  
Value 141.7 million guilders

### Horticultural products (1961):

in thousands of metric tons

Vegetables (Lettuce, cabbage, peas, tomatoes, gherkins etc. and early potatoes)	1,122.9
Fruit (Apples, pears, plums, cherries, grapes etc.)	475.8
Flowers: Tulips	119,251,000 pieces
Roses	114,306,000 pieces
Daffodils	67,671,000 pieces
Gladioli	34,832,000 pieces

### Value of agricultural and horticultural produce (1961):

Agriculture	883 million guilders
Cattle-breeding	4,052 million guilders
Horticulture	1,201 million guilders

### Production of raw materials and energy (1961):

Coal	12,621,000 metric tons
Electrical energy	17,624 million kWh.
Gas	5,202 million m³
Crude petroleum	2,046,000 tons
Salt	1,114,000 tons

### Commerce (1961):

in millions of guilders

Exports from the Netherlands to:	Imports into the Netherlands from:
Germany (West)	Germany (West)
United Kingdom	United Kingdom
Belgium and Luxembourg	Belgium and Luxembourg
France	France
U.S.A.	U.S.A.

### Turnover in some principal industries (1961):

in millions of guilders

	Total value	Exports
Chemical industry	5,305	2,418
Textile industry	2,932	989
Metal industry	11,108	4,009
Manufacture of foodstuffs	10,408	2,360

### Communications:

Railways (1.1.62): 3,250 km, of which 1,624 km are electrified

Main roads (1.1.60): 4,865 km

Navigable rivers and canals (1.1.61): 5,661 km

Mercantile marine (1.1.62): 1,511 ships, 4,803,373 g.r.t.

Goods transported by inland shipping (1961) 63,993,000 tons

International inland shipping (1961) 88,846,000 tons

Sea-going shipping (1961) 113,696,000 tons

Goods traffic in the Netherlands sea-ports (1961):

in thousands of metric tons		
Unloaded: Rotterdam	67,025	Loaded: Rotterdam
Amsterdam	8,258	Amsterdam

### Passengers carried (1961):

Railways	200.5 million
Tram	290.4 million
Bus	721.4 million

### Goods transported (1961):

in thousands of metric tons

Railways	26,445
of which	10,716 international transport
Road	153,204
of which	11,904 crossing the Netherlands frontiers



1980	865,703	Tilburg	140,261
1981	730,323	Nijmegen	134,143
1982	605,211	Enschede	128,780
1983	258,355	Arnhem	125,960
1984	172,388	Breda	111,546
1985	170,373	Apeldoorn	107,240
1986	147,731	Hilversum	102,676

(1980):  
 37.6 %, Roman Catholics 40.4 %, other  
 1.8 %, no religion 18.4 %.

= (French: golden) = appr. £ 0.20.

01 = Tienste	0.10 = Dubbelste
02 = Rijksdaalder	0.05 = Stuiver
03 = Kwartje	0.01 = Cent

total agricultural area (May 1961), in hectares, is:

of holdings (May 1961):

max yield per hectare (1961):

3,933 kg	Barley	3,756 kg
3,834 kg	Potatoes	21,340 kg
3,808 kg	Sugar beet	45,438 kg

1984 (1985-1986):

3,388,000	Sheep	284,000
3,187,000	Hens	37,187,000
125,000	Ducks	1,231,000

[illegible]

Thousands of metric tons	
1960	685.9
	Butter 96.6
	Cheese 213.3
	Condensed milk 408.1
	Milk powder 103.0

1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030, 2032, 2034, 2036, 2038, 2040, 2042, 2044, 2046, 2048, 2050, 2052, 2054, 2056, 2058, 2060, 2062, 2064, 2066, 2068, 2070, 2072, 2074, 2076, 2078, 2080, 2082, 2084, 2086, 2088, 2090, 2092, 2094, 2096, 2098, 2100, 2102, 2104, 2106, 2108, 2110, 2112, 2114, 2116, 2118, 2120, 2122, 2124, 2126, 2128, 2130, 2132, 2134, 2136, 2138, 2140, 2142, 2144, 2146, 2148, 2150, 2152, 2154, 2156, 2158, 2160, 2162, 2164, 2166, 2168, 2170, 2172, 2174, 2176, 2178, 2180, 2182, 2184, 2186, 2188, 2190, 2192, 2194, 2196, 2198, 2200, 2202, 2204, 2206, 2208, 2210, 2212, 2214, 2216, 2218, 2220, 2222, 2224, 2226, 2228, 2230, 2232, 2234, 2236, 2238, 2240, 2242, 2244, 2246, 2248, 2250, 2252, 2254, 2256, 2258, 2260, 2262, 2264, 2266, 2268, 2270, 2272, 2274, 2276, 2278, 2280, 2282, 2284, 2286, 2288, 2290, 2292, 2294, 2296, 2298, 2300, 2302, 2304, 2306, 2308, 2310, 2312, 2314, 2316, 2318, 2320, 2322, 2324, 2326, 2328, 2330, 2332, 2334, 2336, 2338, 2340, 2342, 2344, 2346, 2348, 2350, 2352, 2354, 2356, 2358, 2360, 2362, 2364, 2366, 2368, 2370, 2372, 2374, 2376, 2378, 2380, 2382, 2384, 2386, 2388, 2390, 2392, 2394, 2396, 2398, 2400, 2402, 2404, 2406, 2408, 2410, 2412, 2414, 2416, 2418, 2420, 2422, 2424, 2426, 2428, 2430, 2432, 2434, 2436, 2438, 2440, 2442, 2444, 2446, 2448, 2450, 2452, 2454, 2456, 2458, 2460, 2462, 2464, 2466, 2468, 2470, 2472, 2474, 2476, 2478, 2480, 2482, 2484, 2486, 2488, 2490, 2492, 2494, 2496, 2498, 2500, 2502, 2504, 2506, 2508, 2510, 2512, 2514, 2516, 2518, 2520, 2522, 2524, 2526, 2528, 2530, 2532, 2534, 2536, 2538, 2540, 2542, 2544, 2546, 2548, 2550, 2552, 2554, 2556, 2558, 2560, 2562, 2564, 2566, 2568, 2570, 2572, 2574, 2576, 2578, 2580, 2582, 2584, 2586, 2588, 2590, 2592, 2594, 2596, 2598, 2600, 2602, 2604, 2606, 2608, 2610, 2612, 2614, 2616, 2618, 2620, 2622, 2624, 2626, 2628, 2630, 2632, 2634, 2636, 2638, 2640, 2642, 2644, 2646, 2648, 2650, 2652, 2654, 2656, 2658, 2660, 2662, 2664, 2666, 2668, 2670, 2672, 2674, 2676, 2678, 2680, 2682, 2684, 2686, 2688, 2690, 2692, 2694, 2696, 2698, 2700, 2702, 2704, 2706, 2708, 2710, 2712, 2714, 2716, 2718, 2720, 2722, 2724, 2726, 2728, 2730, 2732, 2734, 2736, 2738, 2740, 2742, 2744, 2746, 2748, 2750, 2752, 2754, 2756, 2758, 2760, 2762, 2764, 2766, 2768, 2770, 2772, 2774, 2776, 2778, 2780, 2782, 2784, 2786, 2788, 2790, 2792, 2794, 2796, 2798, 2800, 2802, 2804, 2806, 2808, 2810, 2812, 2814, 2816, 2818, 2820, 2822, 2824, 2826, 2828, 2830, 2832, 2834, 2836, 2838, 2840, 2842, 2844, 2846, 2848, 2850, 2852, 2854, 2856, 2858, 2860, 2862, 2864, 2866, 2868, 2870, 2872, 2874, 2876, 2878, 2880, 2882, 2884, 2886, 2888, 2890, 2892, 2894, 2896, 2898, 2900, 2902, 2904, 2906, 2908, 2910, 2912, 2914, 2916, 2918, 2920, 2922, 2924, 2926, 2928, 2930, 2932, 2934, 2936, 2938, 2940, 2942, 2944, 2946, 2948, 2950, 2952, 2954, 2956, 2958, 2960, 2962, 2964, 2966, 2968, 2970, 2972, 2974, 2976, 2978, 2980, 2982, 2984, 2986, 2988, 2990, 2992, 2994, 2996, 2998, 3000, 3002, 3004, 3006, 3008, 3010, 3012, 3014, 3016, 3018, 3020, 3022, 3024, 3026, 3028, 3030, 3032, 3034, 3036, 3038, 3040, 3042, 3044, 3046, 3048, 3050, 3052, 3054, 3056, 3058, 3060, 3062, 3064, 3066, 3068, 3070, 3072, 3074, 3076, 3078, 3080, 3082, 3084, 3086, 3088, 3090, 3092, 3094, 3096, 3098, 3100, 3102, 3104, 3106, 3108, 3110, 3112, 3114, 3116, 3118, 3120, 3122, 3124, 3126, 3128, 3130, 3132, 3134, 3136, 3138, 3140, 3142, 3144, 3146, 3148, 3150, 3152, 3154, 3156, 3158, 3160, 3162, 3164, 3166, 3168, 3170, 3172, 3174, 3176, 3178, 3180, 3182, 3184, 3186, 3188, 3190, 3192, 3194, 3196, 3198, 3200, 3202, 3204, 3206, 3208, 3210, 3212, 3214, 3216, 3218, 3220, 3222, 3224, 3226, 3228, 3230, 3232, 3234, 3236, 3238, 3240, 3242, 3244, 3246, 3248, 3250, 3252, 3254, 3256, 3258, 3260, 3262, 3264, 3266, 3268, 3270, 3272, 3274, 3276, 3278, 3280, 3282, 3284, 3286, 3288, 3290, 3292, 3294, 3296, 3298, 3300, 3302, 3304, 3306, 3308, 3310, 3312, 3314, 3316, 3318, 3320, 3322, 3324, 3326, 3328, 3330, 3332, 3334, 3336, 3338, 3340, 3342, 3344, 3346, 3348, 3350, 3352, 3354, 3356, 3358, 33

441.3 in thousands of metric tons  
441.3 million guilders

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hundreds of metric tons	
olives (lettuce, cabbage, peas, tomatoes, zucchini etc. and early potatoes)	1,122.9
lemons, oranges, plums, cherries, peaches etc.	475

Tulips	119,251,000 pieces
Roses	118,306,000 pieces
Hydrangeas	67,671,000 pieces
Chrysanthemums	38,813,000 pieces

## Value of agricultural and horticultural produce (1961):

Agriculture	883 million guilders
Cattle-breeding	4,052 million guilders
Horticulture	1,201 million guilders

## Production of raw materials and energy (1961):

Coal	12,621,000 metric tons
Electrical energy	17,624 million kWh.
Gas	5,202 million m <sup>3</sup>
Crude petroleum	2,046,000 tons
Salt	1,114,000 tons

Commerce (1961):

in millions of guilders

Exports from the Netherlands to:	Imports into the Netherlands from:
Germany (West) 3,630	Germany (West) 4,313
United Kingdom 1,564	United Kingdom 1,335
Belgium and Luxembourg 2,373	Belgium and Luxembourg 3,549
France 978	France 857
U.S.A. 691	U.S.A. 2,073

Turnover in some principal industries (1961):

in millions of guilders

	Total value	Exports
Chemical industry	5,305	2,418
Textile industry	2,932	989
Metal industry	11,108	4,009
Manufacture of foodstuffs	10,408	2,360

**Communications:**

Railways (1.1.62): 3,250 km, of which 1,624 km are electrified

Main roads (1.1.60): 4,865 km

Navigable rivers and canals (1.1.61): 5,661 km

Mercantile marine (1.1.62): 1,511 ships, 4,803,373 g.r.t.

Goods transported by inland shipping (1961)	63,993,000 tons
International inland shipping (1961)	88,846,000 tons

International inland shipping (1961)	88,846,000 tons
Sea-going shipping (1961)	113,696,000 tons

sea-going shipping (1961)

Goods traffic in the Netherlands is thousands of metric tons.

in thousands of metric tons				
Unloaded:	Rotterdam	67,025	Loaded: Rotterdam	23,116
	Amsterdam	8,258	Amsterdam	2,988

Passengers carried (1961):

Railways	200.5 million
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Team	290.4 million
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Goods transported (1961)

in thousands of metric tons

Railways	26,445
of which:	18,316 international companies

of which	10,716
Used	153,204

Road	153,204
of which	11,904 crossing the Netherlands frontiers

of which 11,704 crossing the international frontier

## THE NETHERLANDS

